Apollo

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Attn: R. L. Stallings

PACKAGE 1

Apollo

APOLLO

ENGINEERING ANALYSIS PLOTS [U]

BOILERPLATE # 13

JOHN F. KENNEDY SPACE CENTER

N79-76568

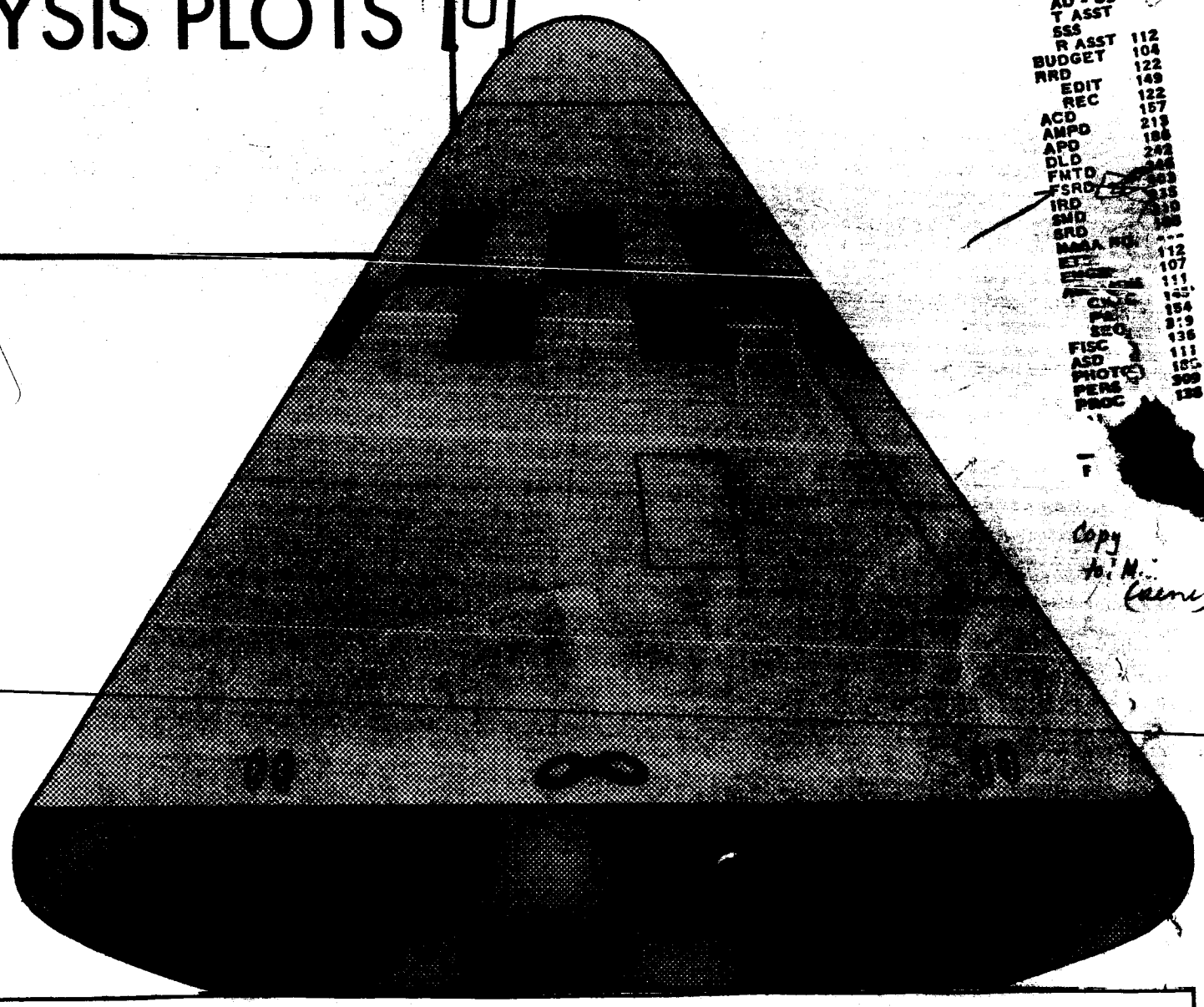
Unclas
00/31 11457

(NASA-TM-X-66761) APOLLO ENGINEERING ANALYSIS PLOTS, BOILPLATE NO. 13 (NASA) 500 p

FACILITY FORM 602 (ACCESSION NUMBER) (CATEGORY)

(NASA CR OR TMX OR AD NUMBER)

AVAILABLE TO NASA OFFICES AND NASA RESEARCH CENTERS ONLY



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MAY 1964

● Prepared by: COMPUTATION AND ANALYSIS DIVISION ● MSC Houston ●

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NASA-LANGLEY MAY 13 1965

C65-5439

CLASSIFICATION CHANGED
To UNCLASSIFIED
By authority of GD-Ltr 11/6/62
Changed by Shirley Date 12/3/62
Classified Document Master Control Station,
Scientific and Technical Information Facility

NOTICE

THE DATA PRESENTED IN THIS PAPER REPRESENT ENGINEERING DATA AS RECORDED ON THE BP-13 FLIGHT. THE PURPOSE OF THIS PAPER IS TO PRESENT, AS RAPIDLY AS POSSIBLE, THE RECORDED DATA FOR ANALYSIS BY SYSTEM SPECIALISTS. THE DATA ARE PRESENTED IN BOTH TABULAR AND GRAPHICAL FORM.

THE DATA AND FILM FROM WHICH THIS PAPER WAS PREPARED ARE AVAILABLE FOR PREPARATION OF HIGHER QUALITY PRINTS FOR ENCLOSURE IN REPORTS ON THE RESULTS OF THE BP-13 FLIGHT.

GROUP 4
Downgraded at 3 year
Intervals;declassified
after 12 years

THIS MATERIAL CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF THE ESPIONAGE LAWS, TITLE 18, U.S.C. SECTIONS 793 AND 794, THE TRANSMISSION OR REVELATION OF WHICH IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW.

AVAILABLE TO NASA HEADQUARTERS ONLY

SERIES	CONTENTS
100	ACCELERATIONS, STRAIN GAUGES
200	ELECTRICAL
300	AMPLIFIER AND TRANSMITTER TEMPERATURE
400	INTERIOR TEMPERATURES AND PRESSURES
500	CONICAL SURFACE PRESSURES
600	HEAT FLUX, BODY TEMPERATURES AND TOWER TEMPERATURES
800	RMS TIME HISTORIES OF FLUCTUATING PRESSURES, LOW FREQUENCY ACCELERATIONS AND RADIAL VIBRATIONS

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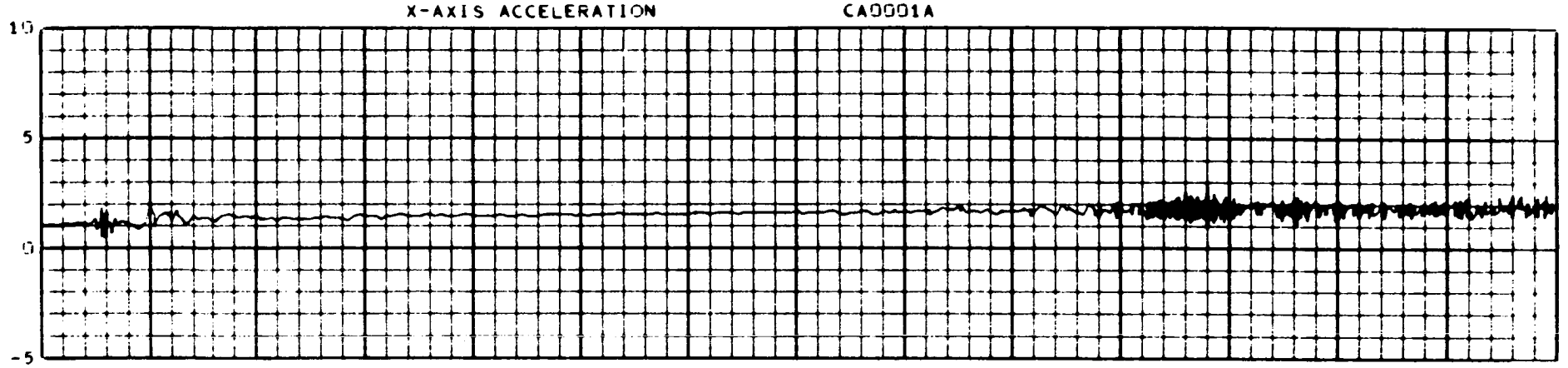

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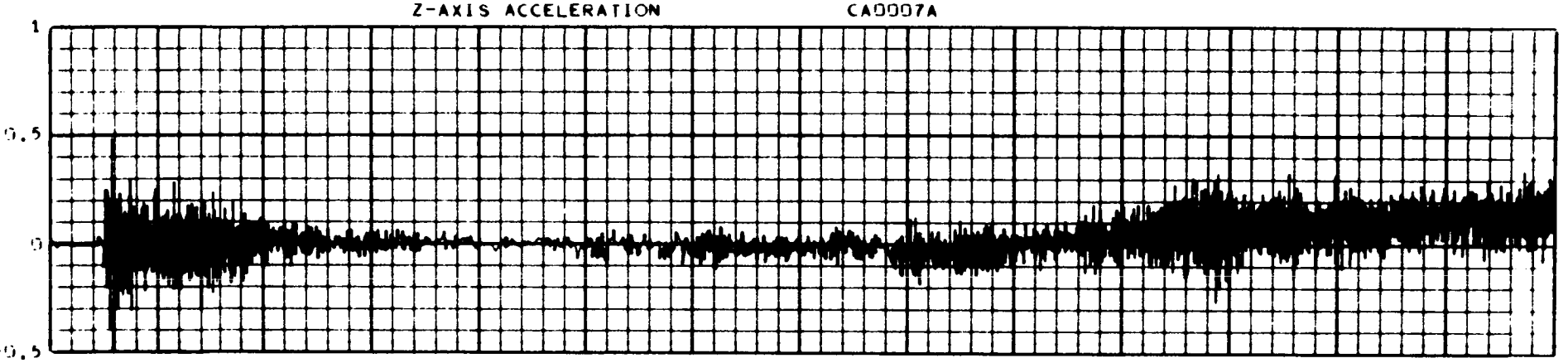

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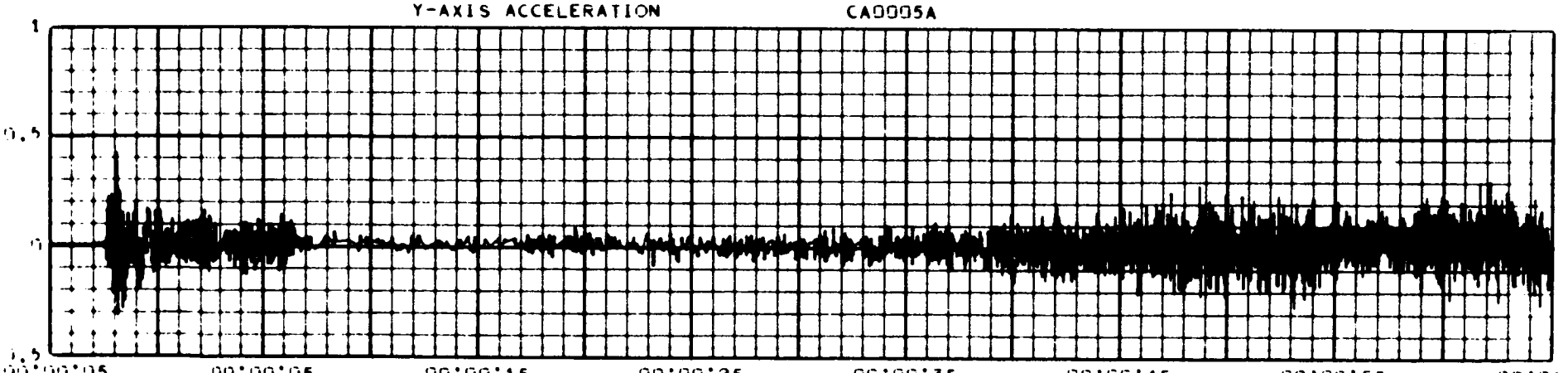

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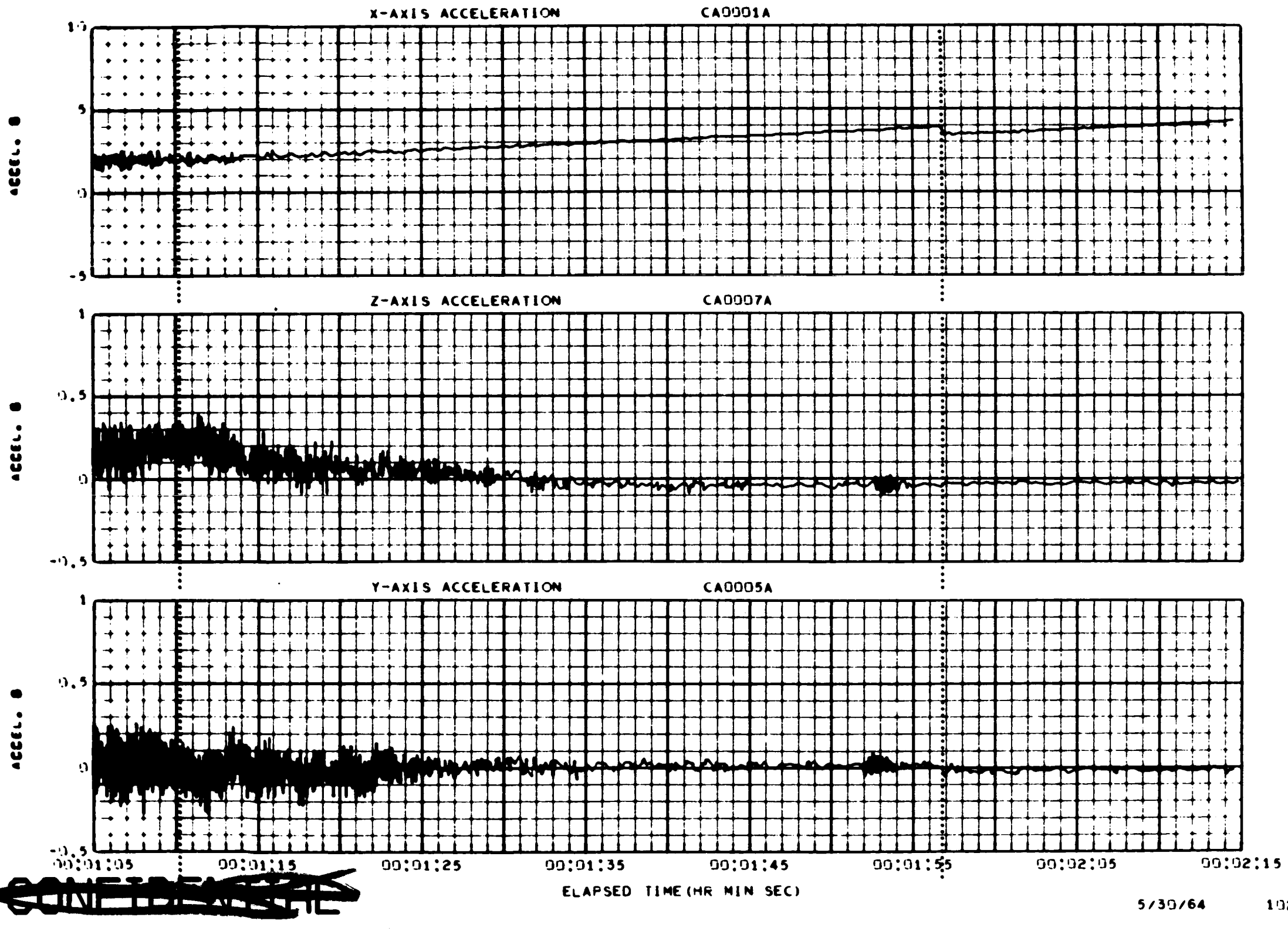

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APOLLO BP-13

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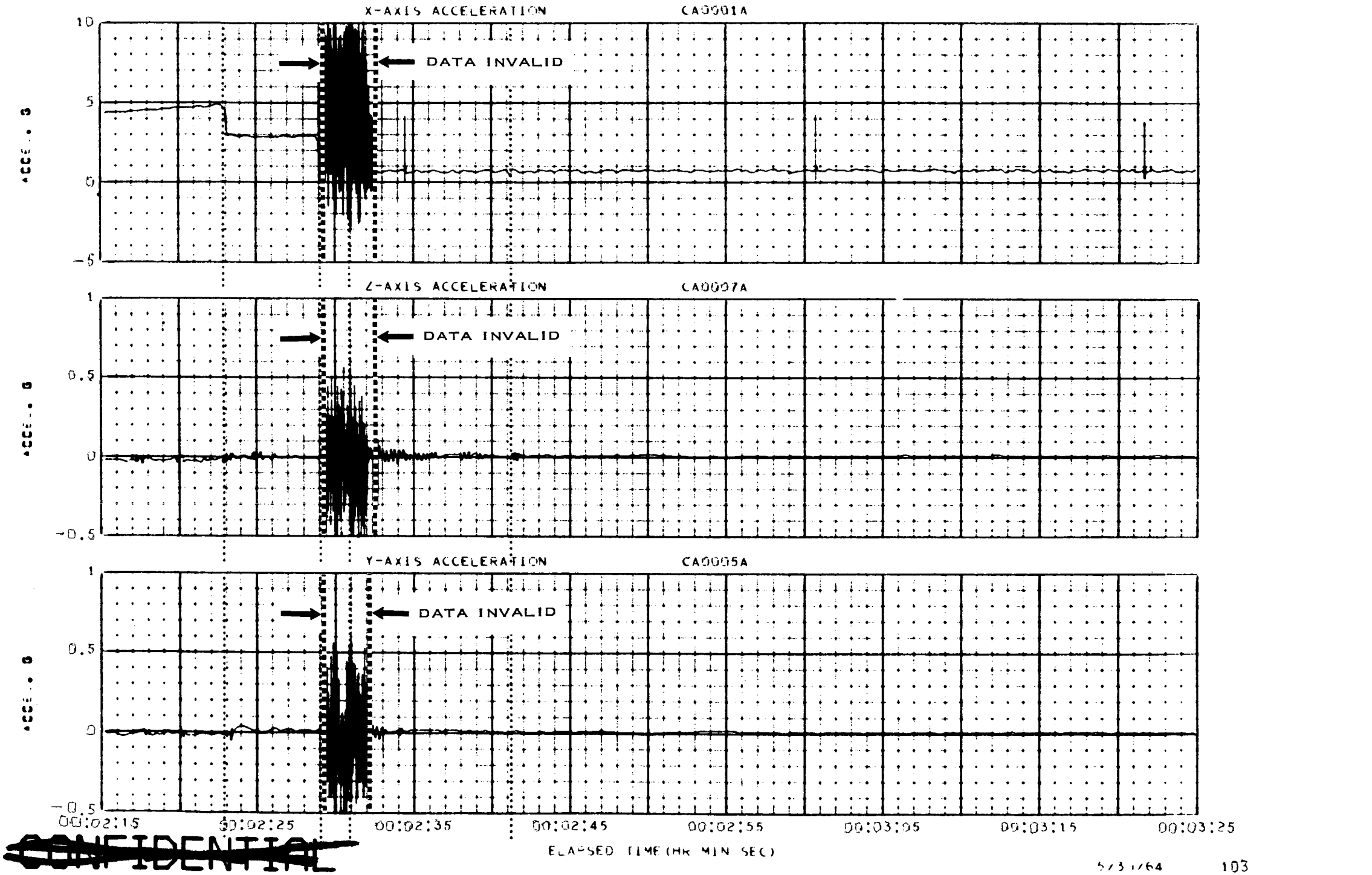

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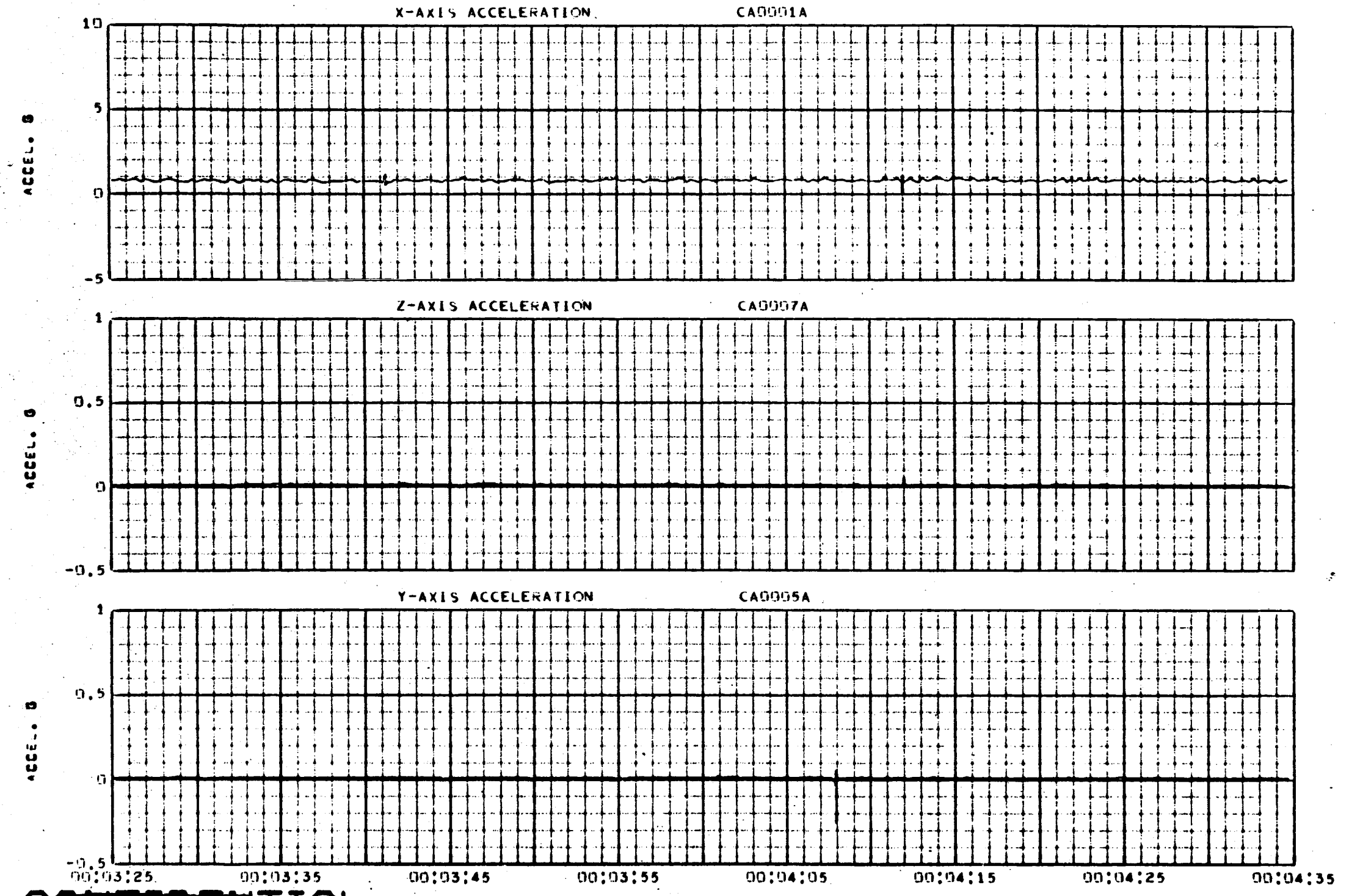

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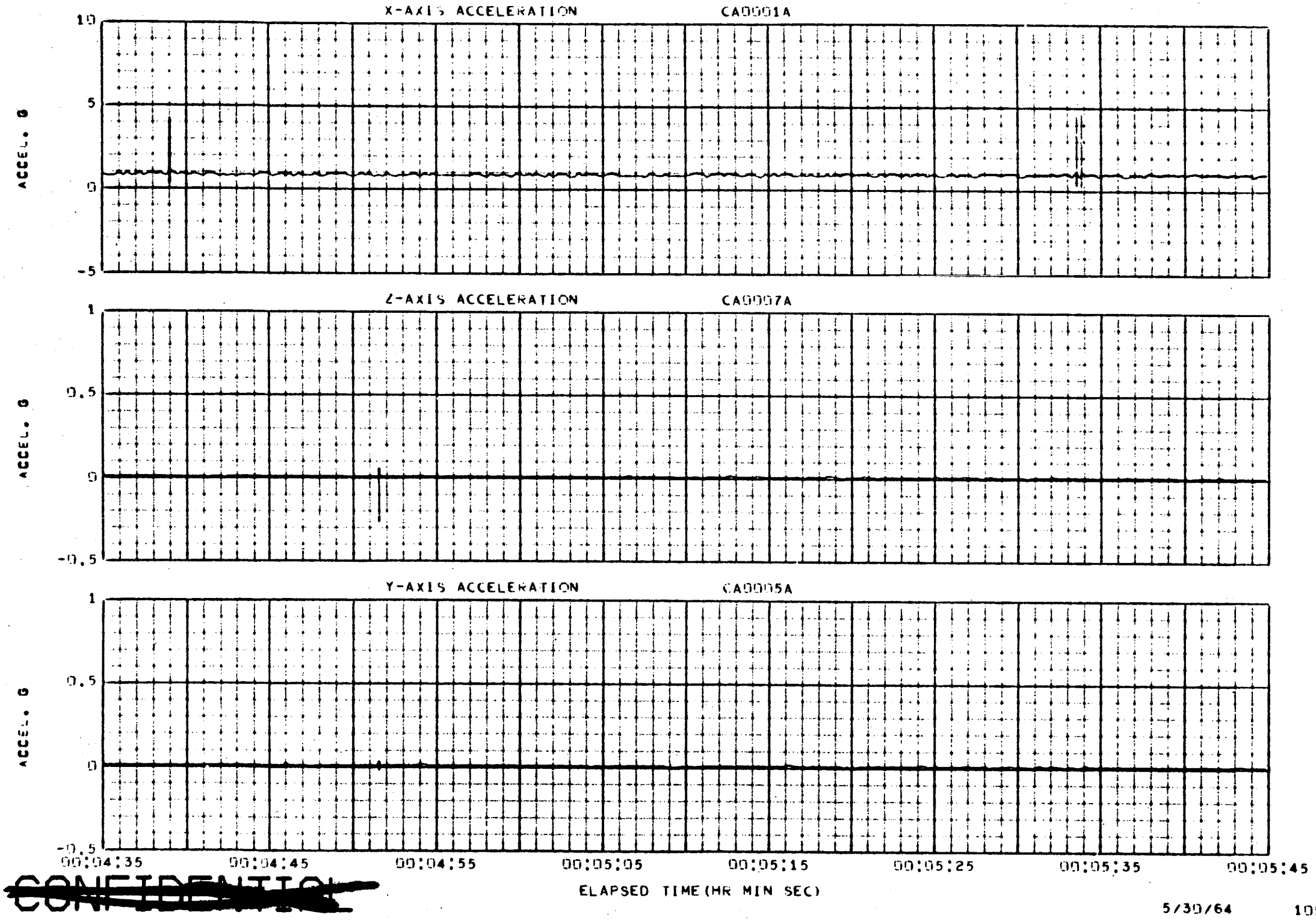

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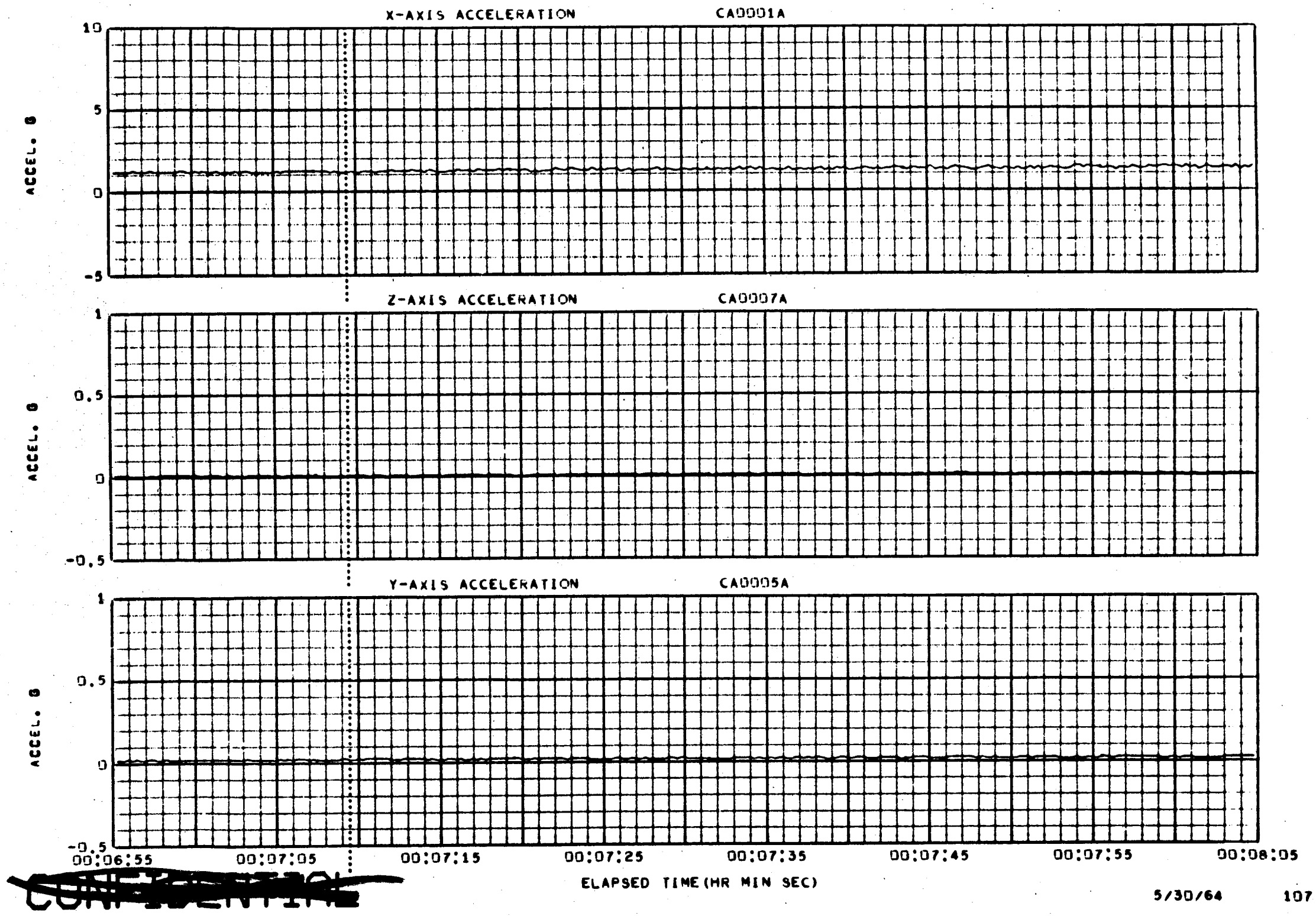
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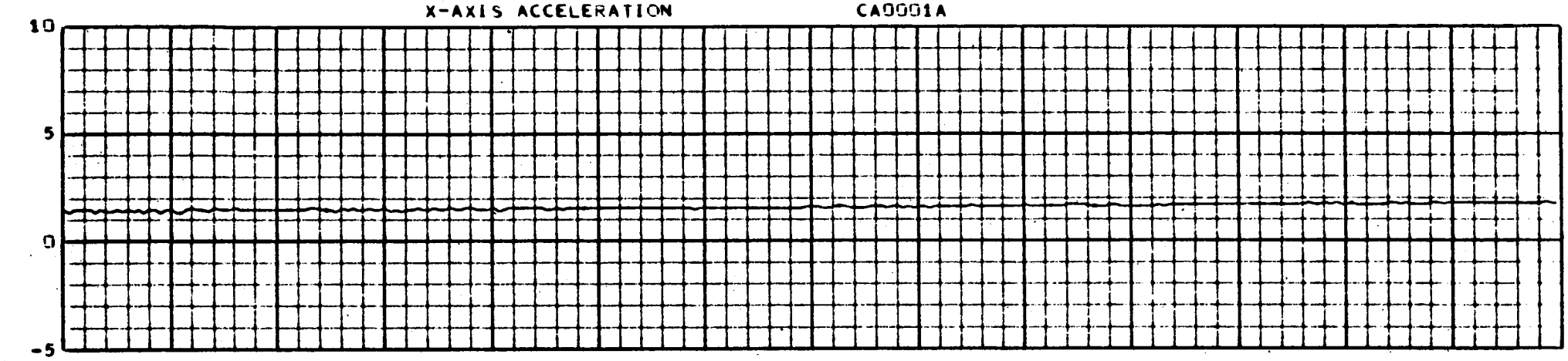

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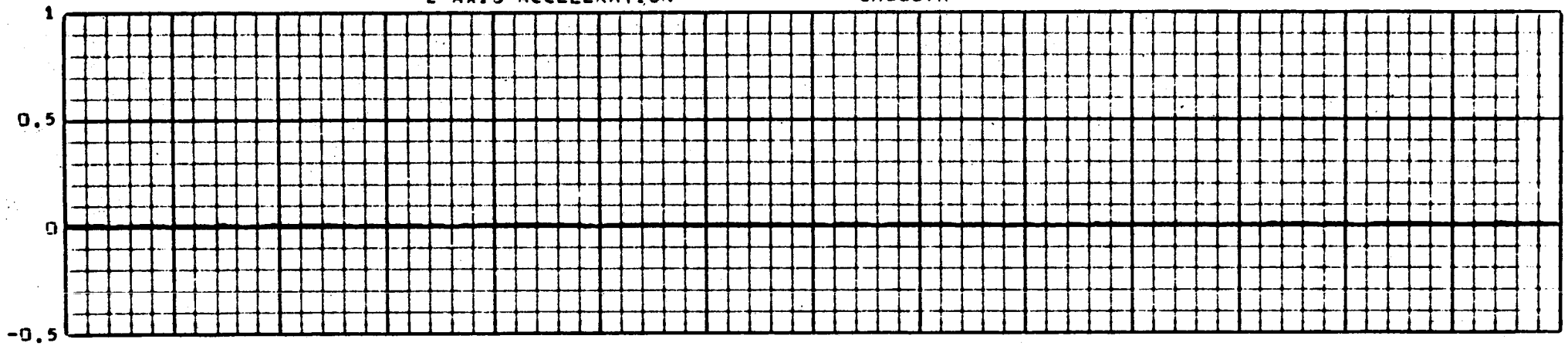

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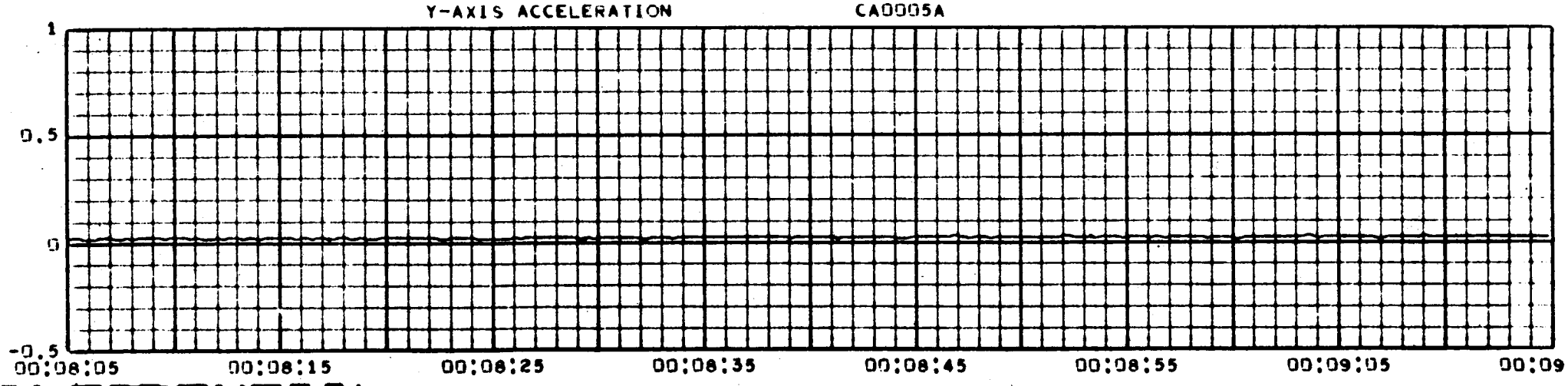

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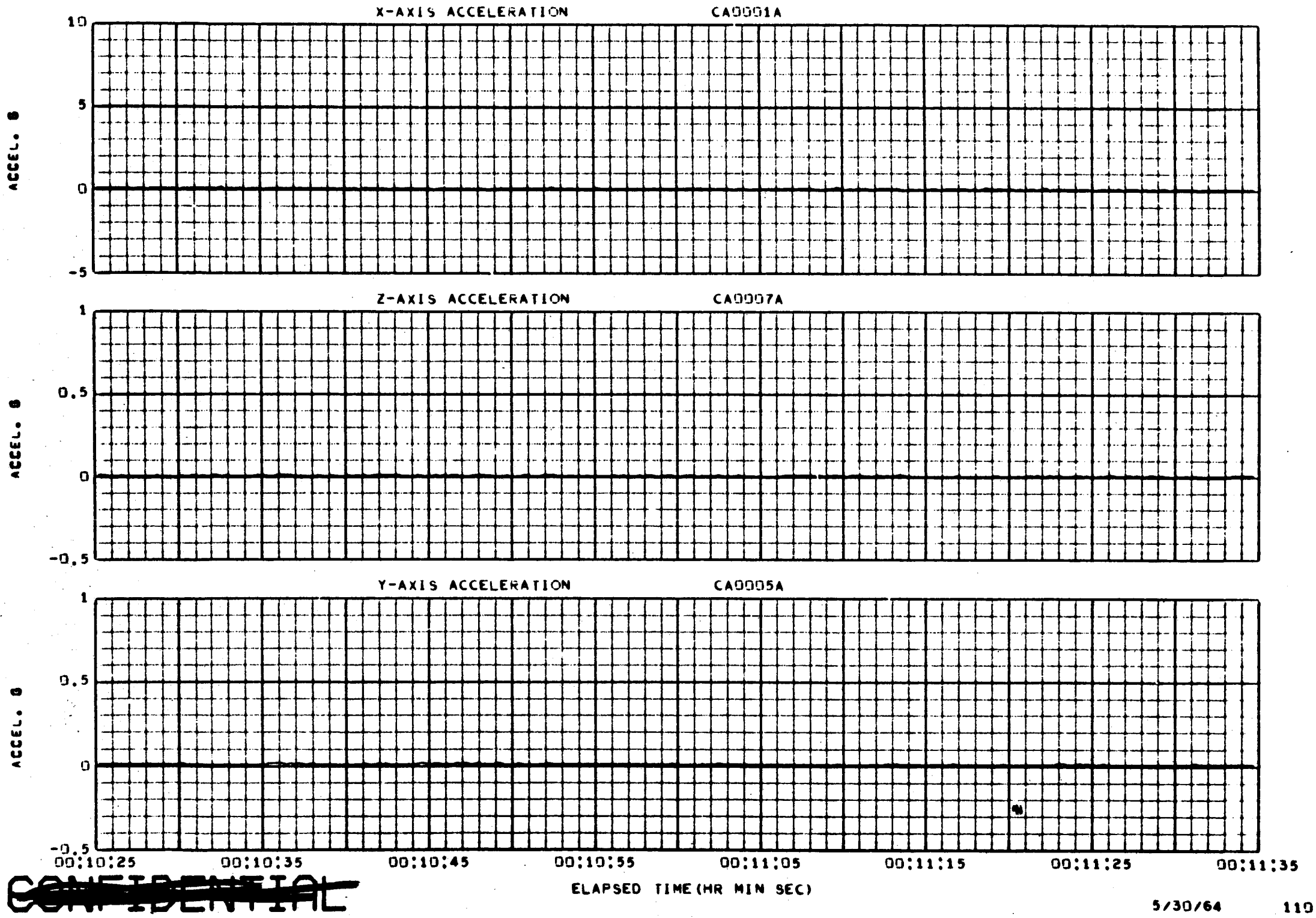

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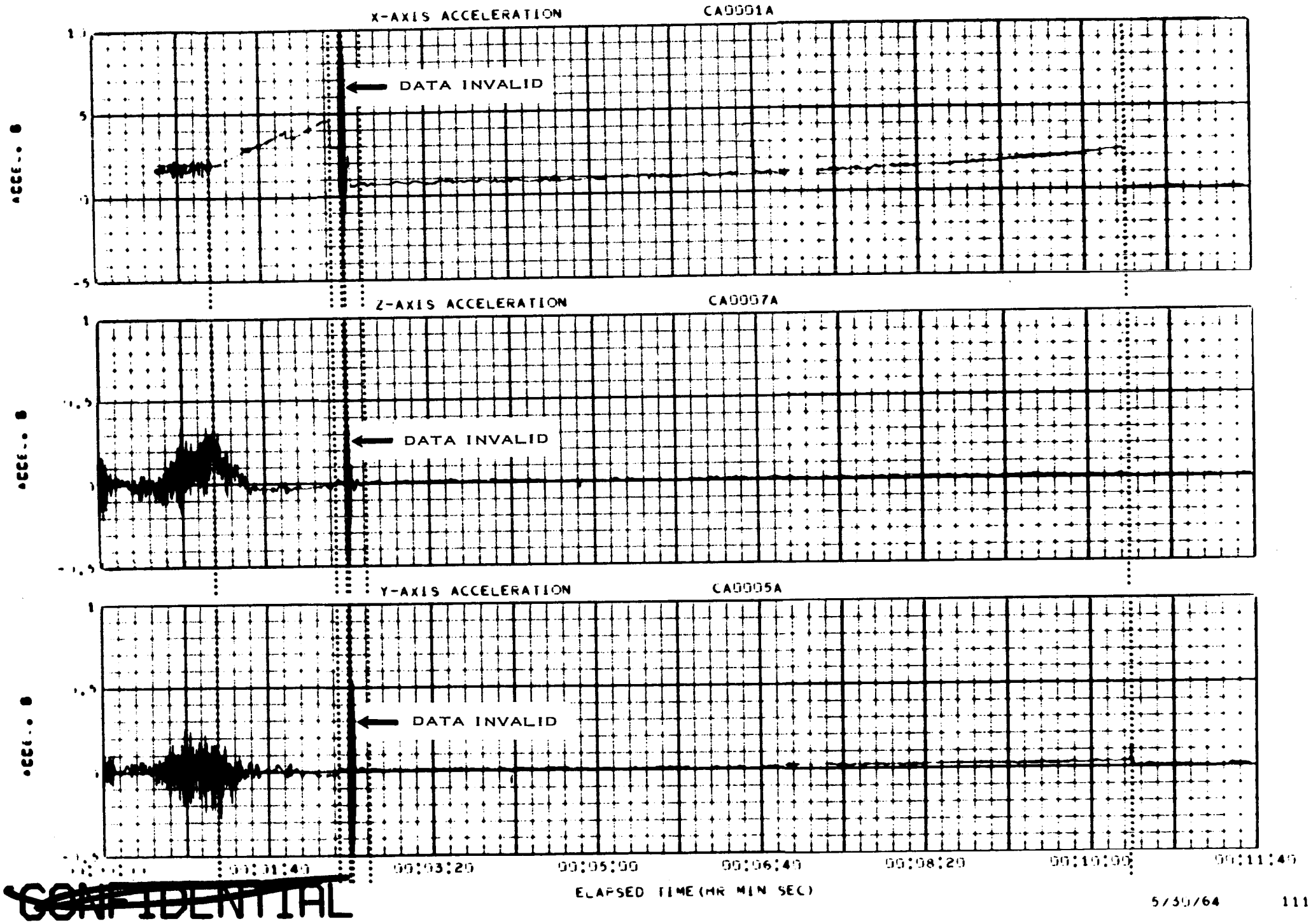

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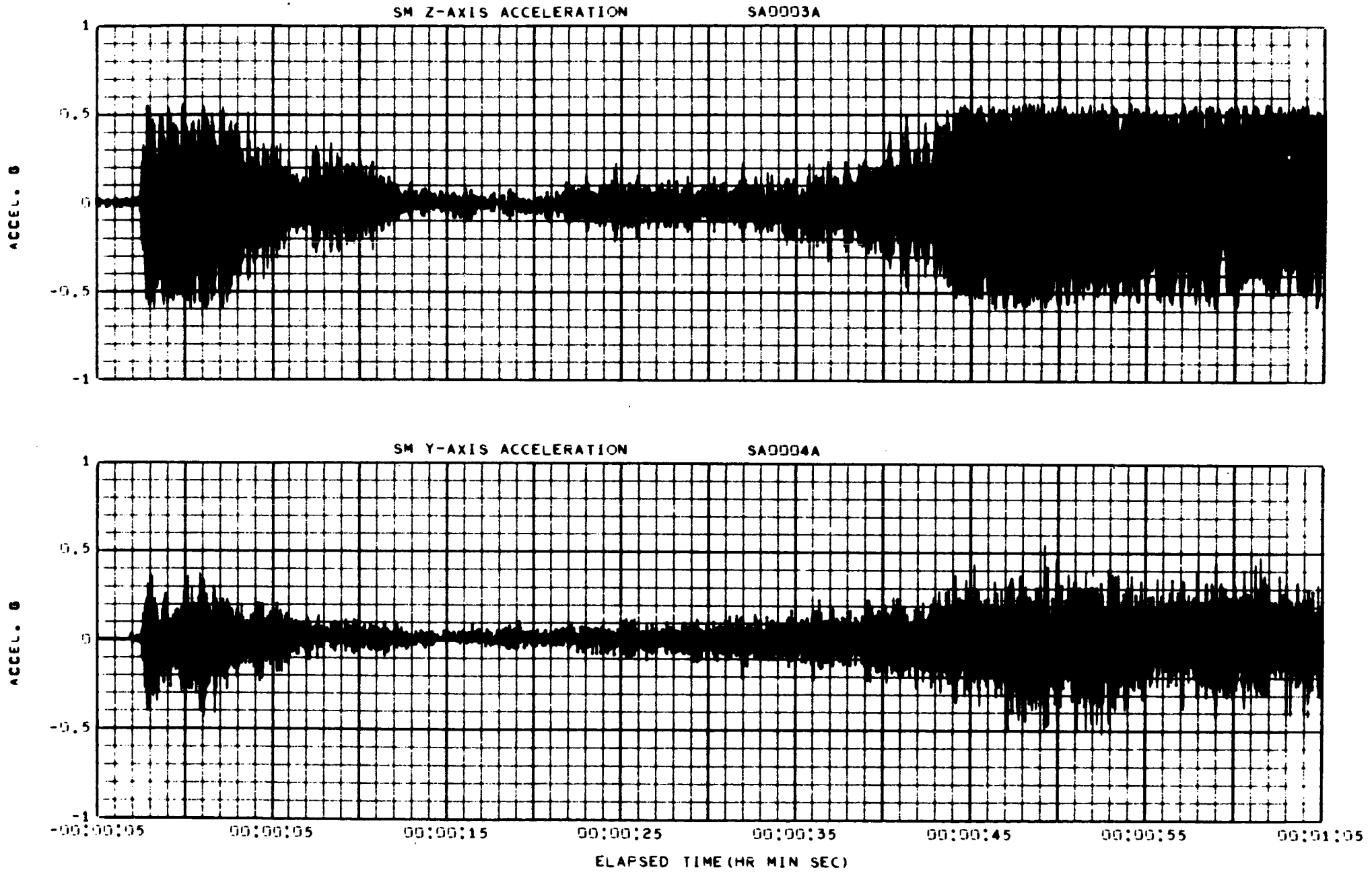

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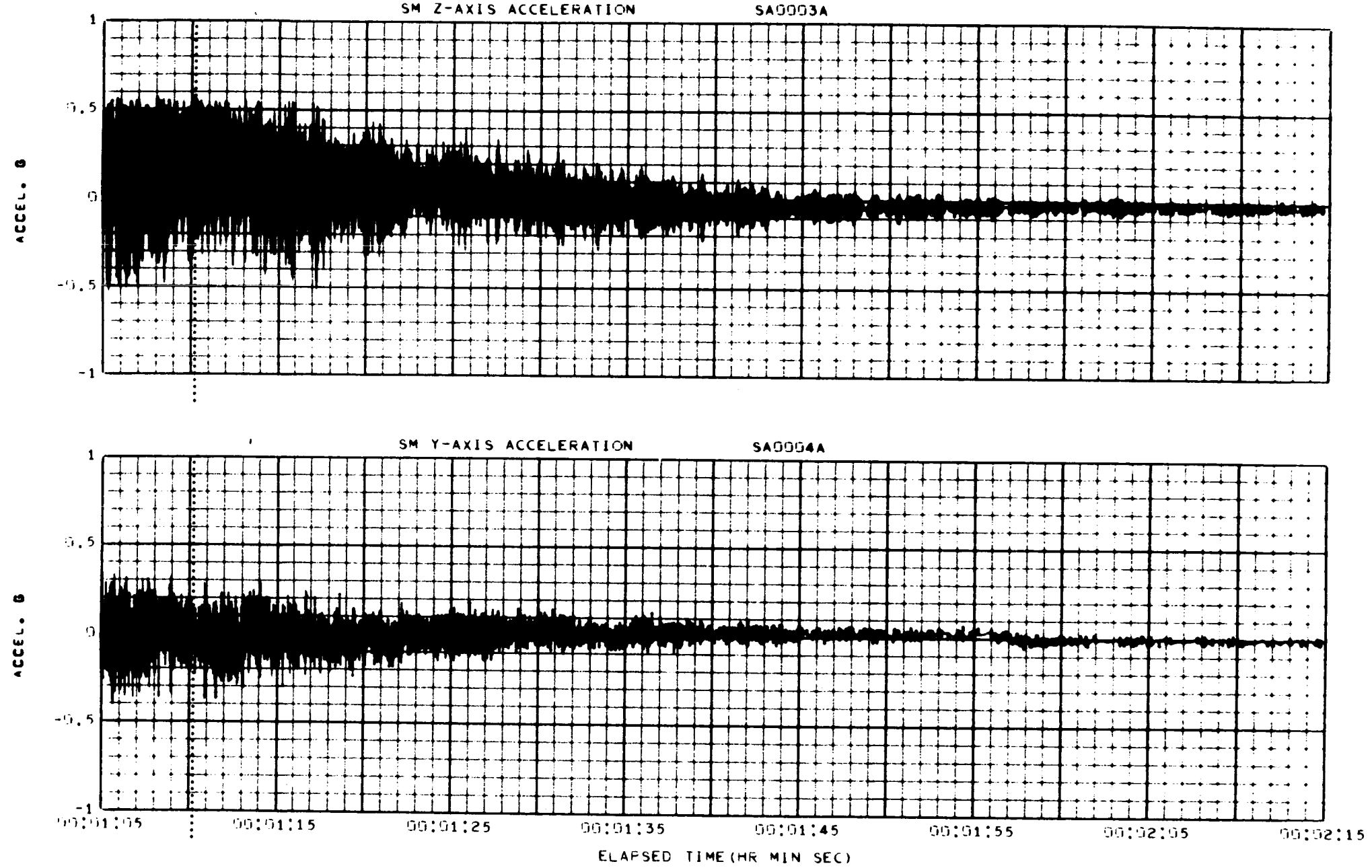

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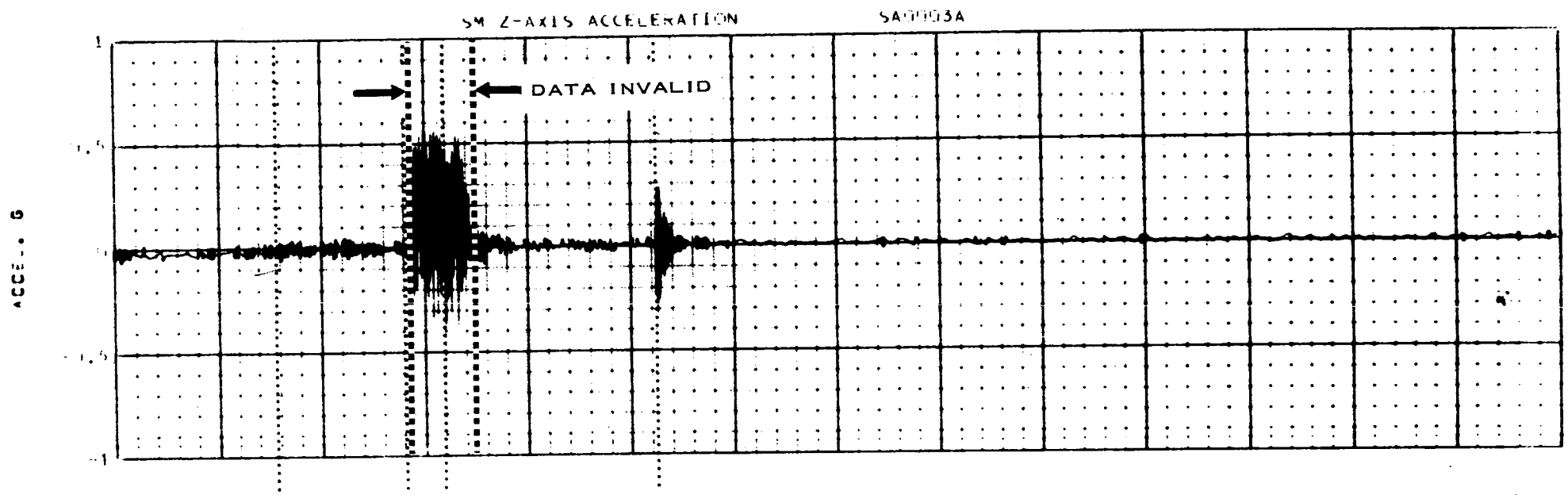
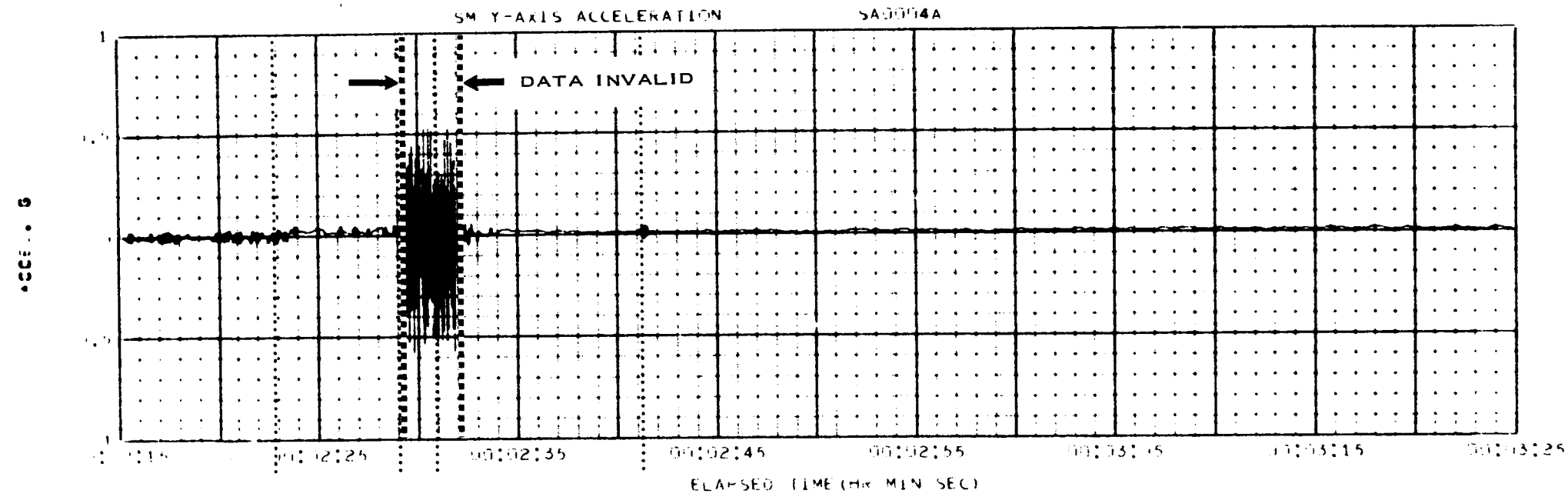
APOLLO SPACECRAFT 13





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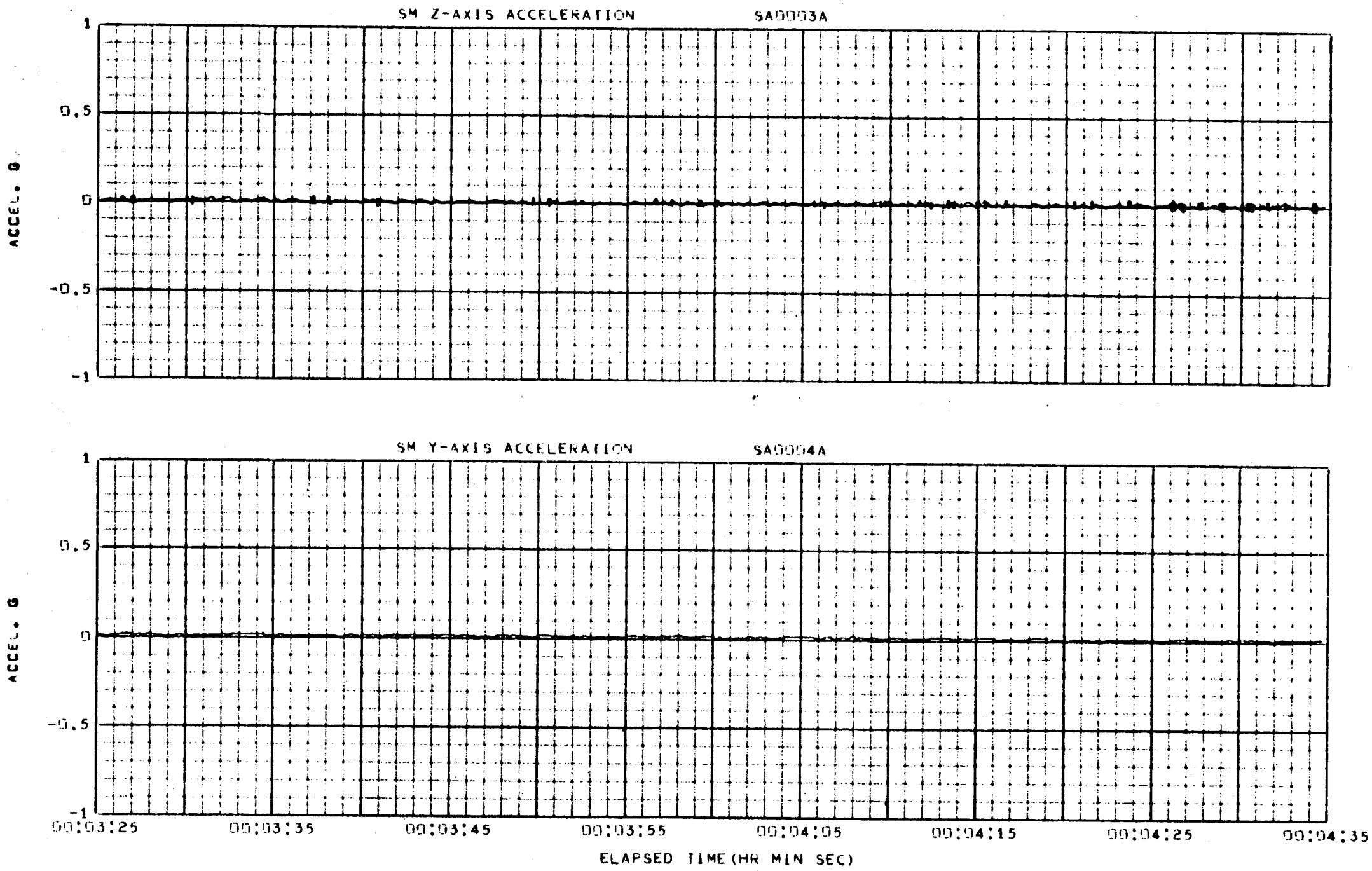

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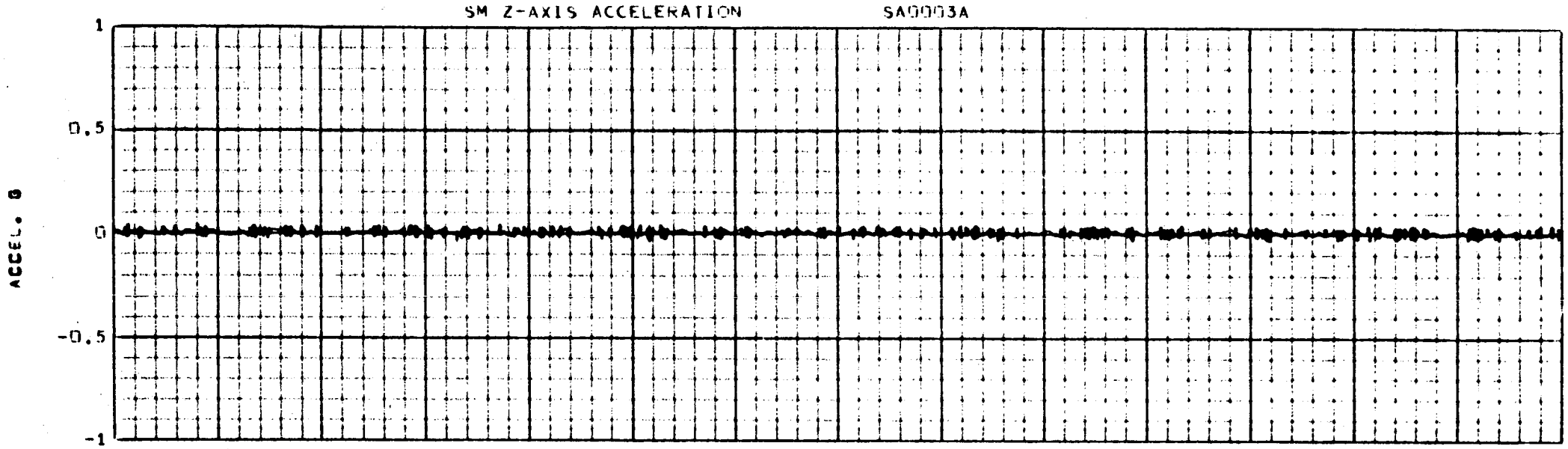

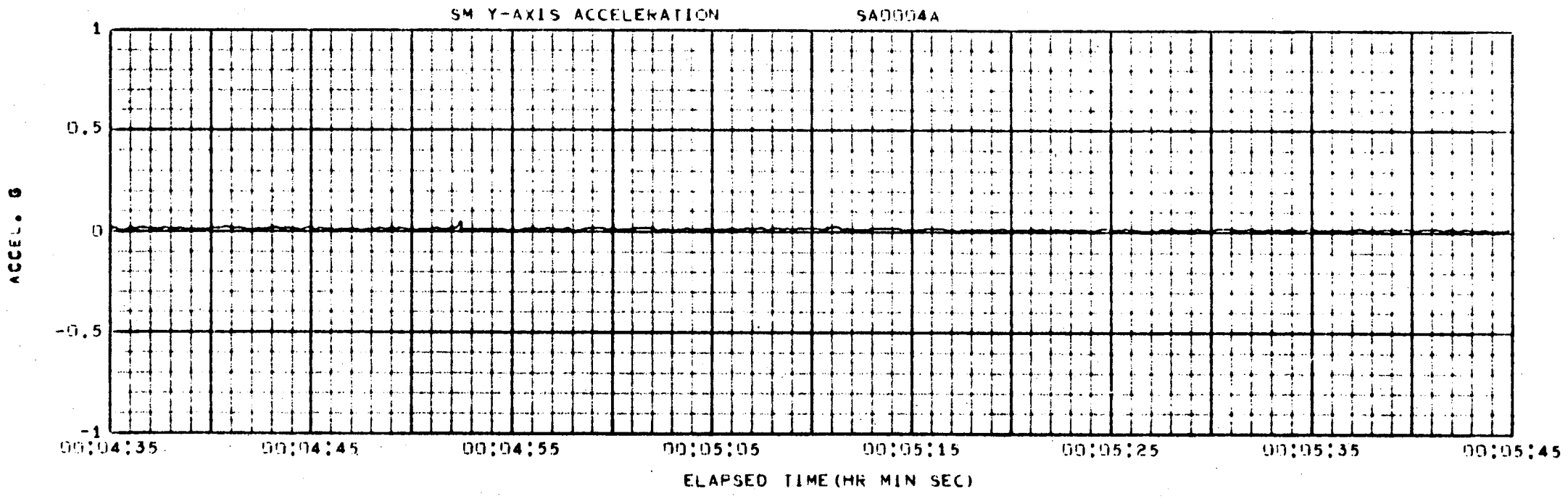

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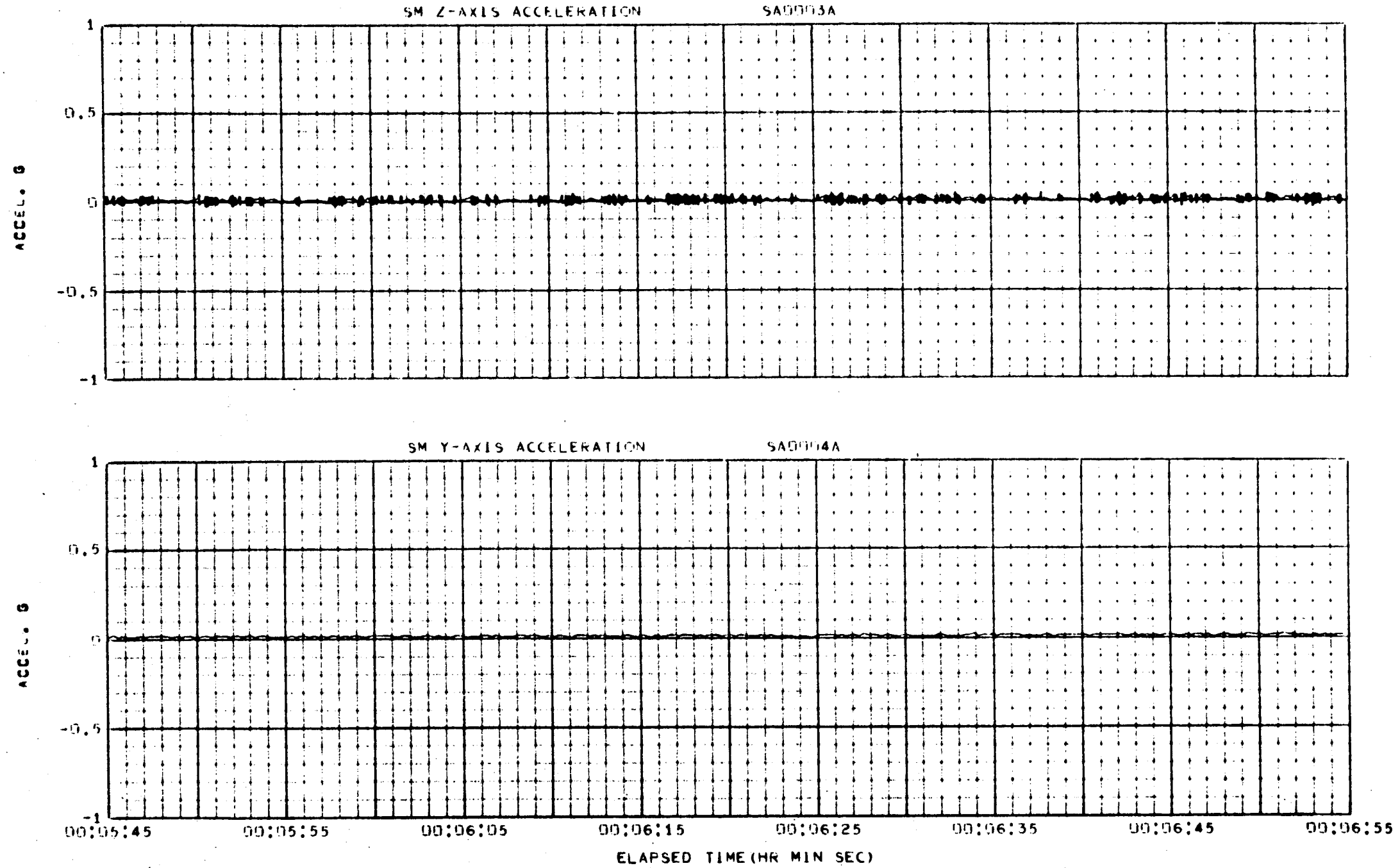

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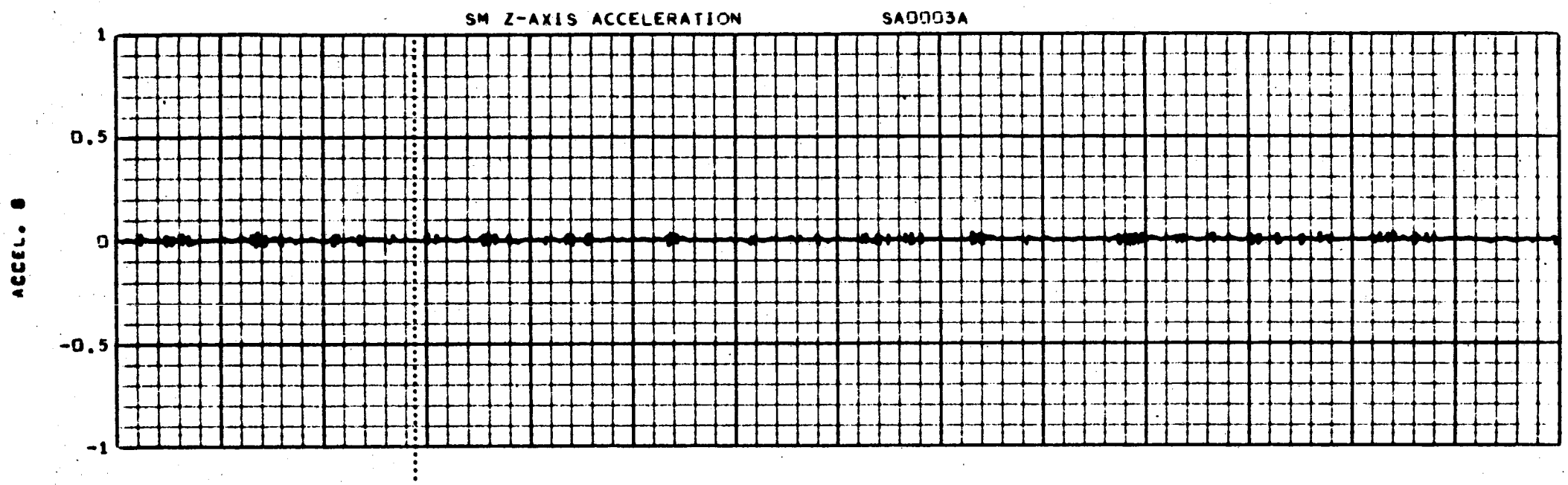
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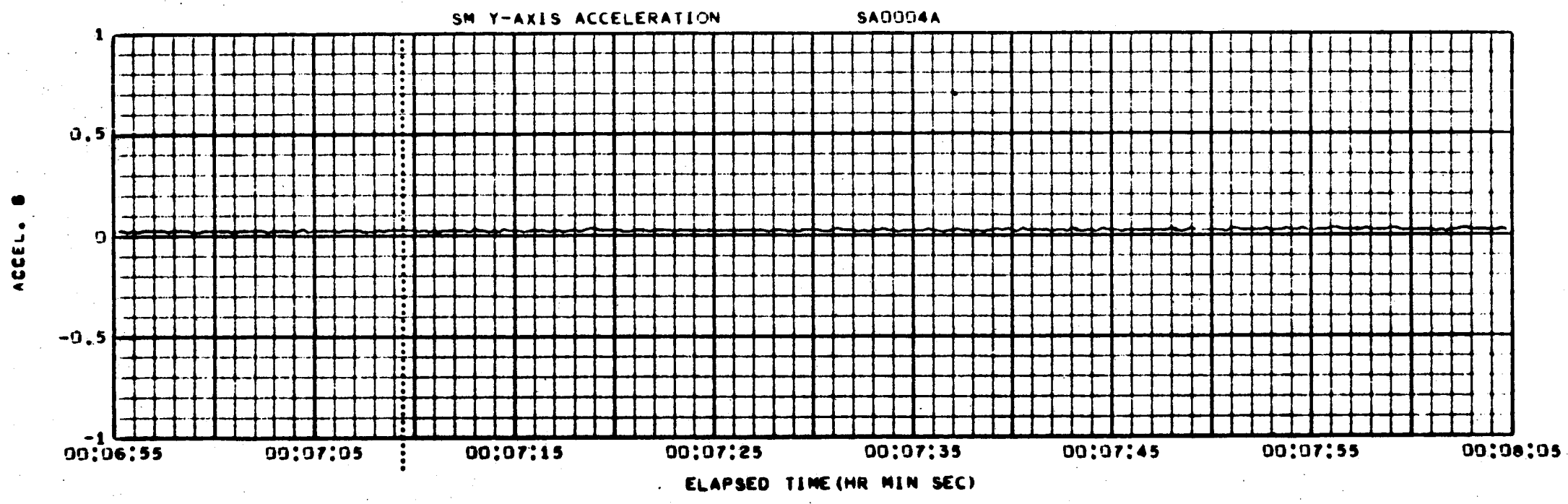
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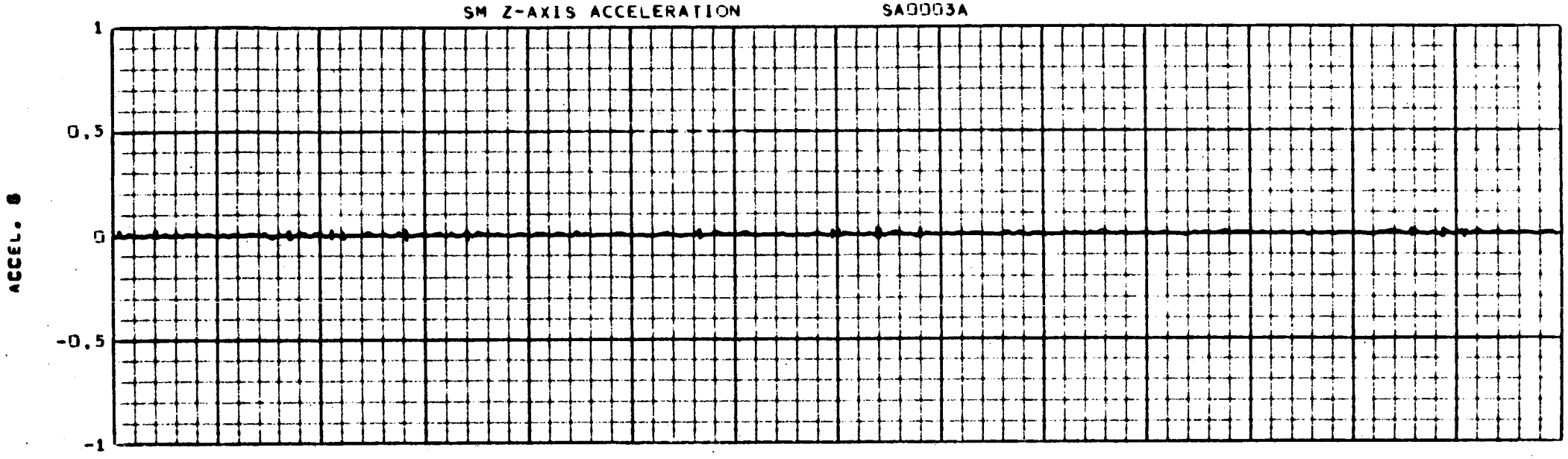

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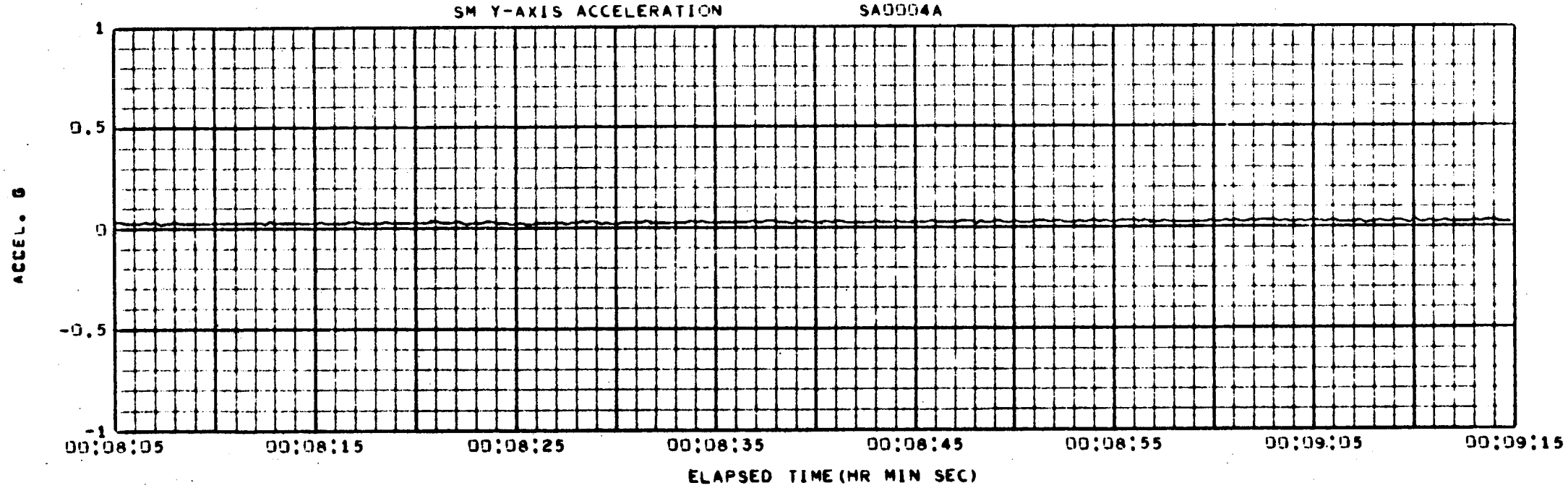

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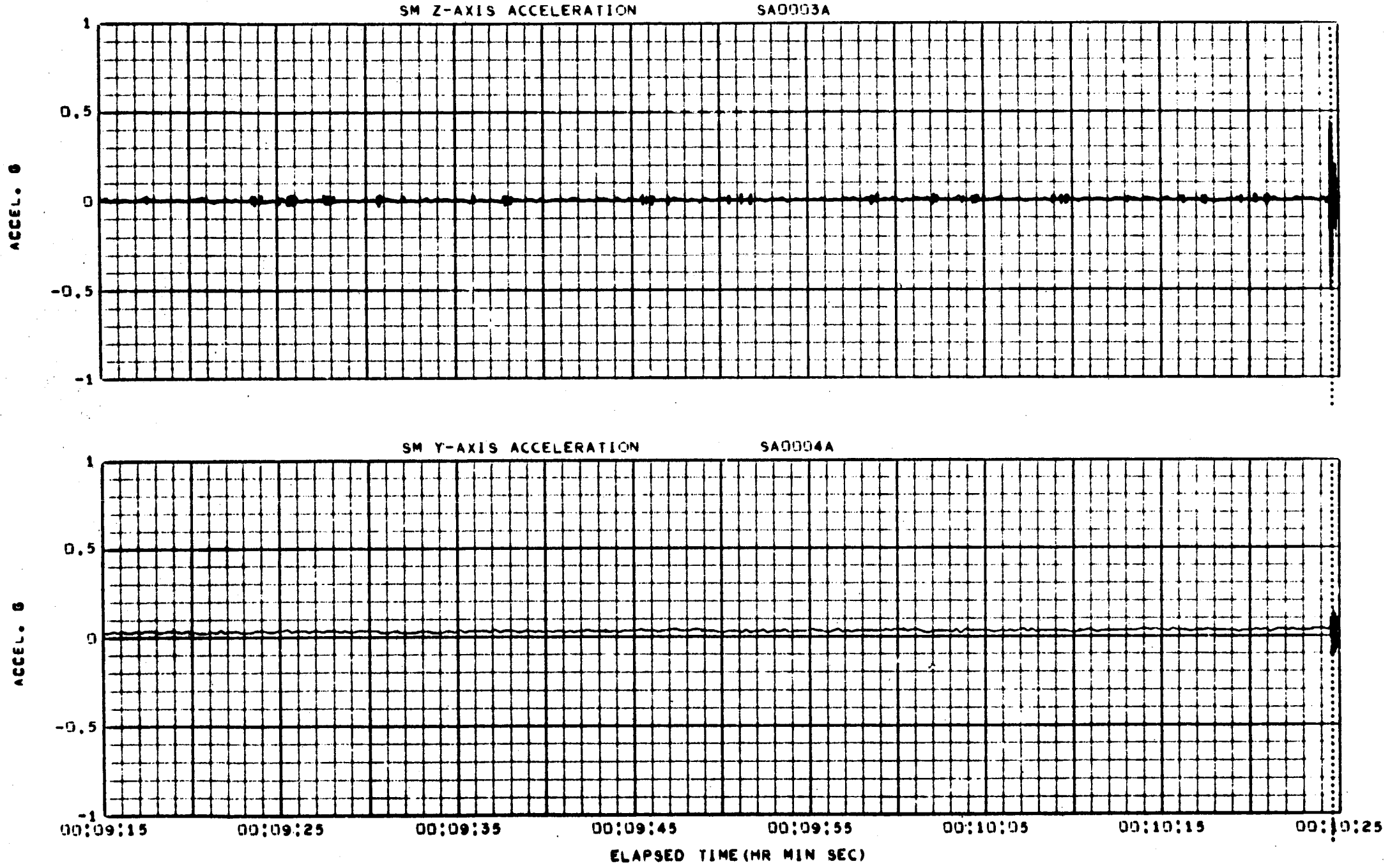
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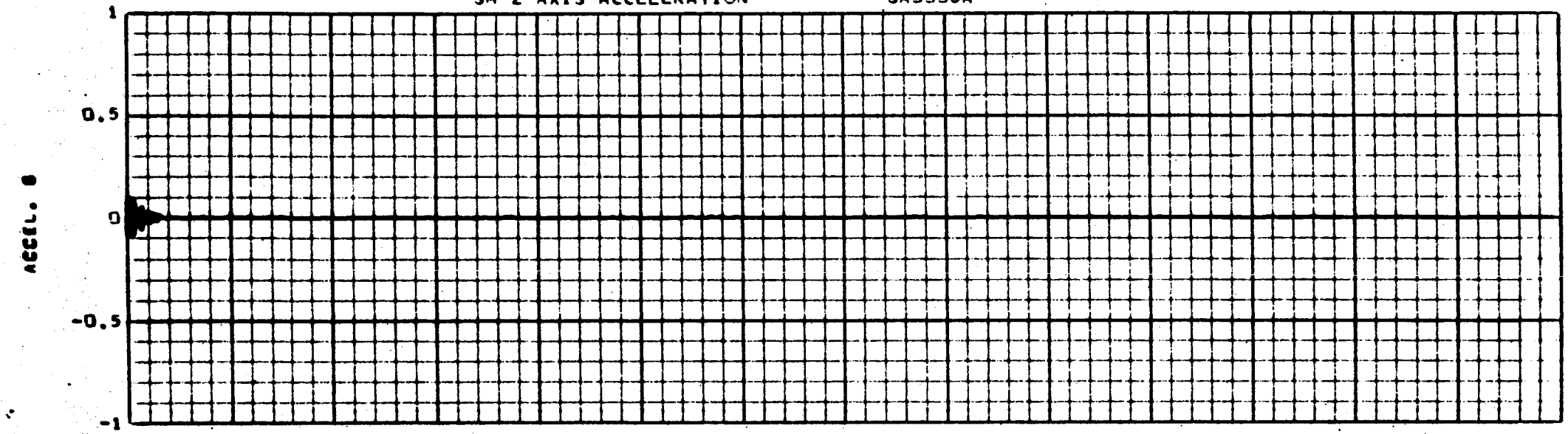

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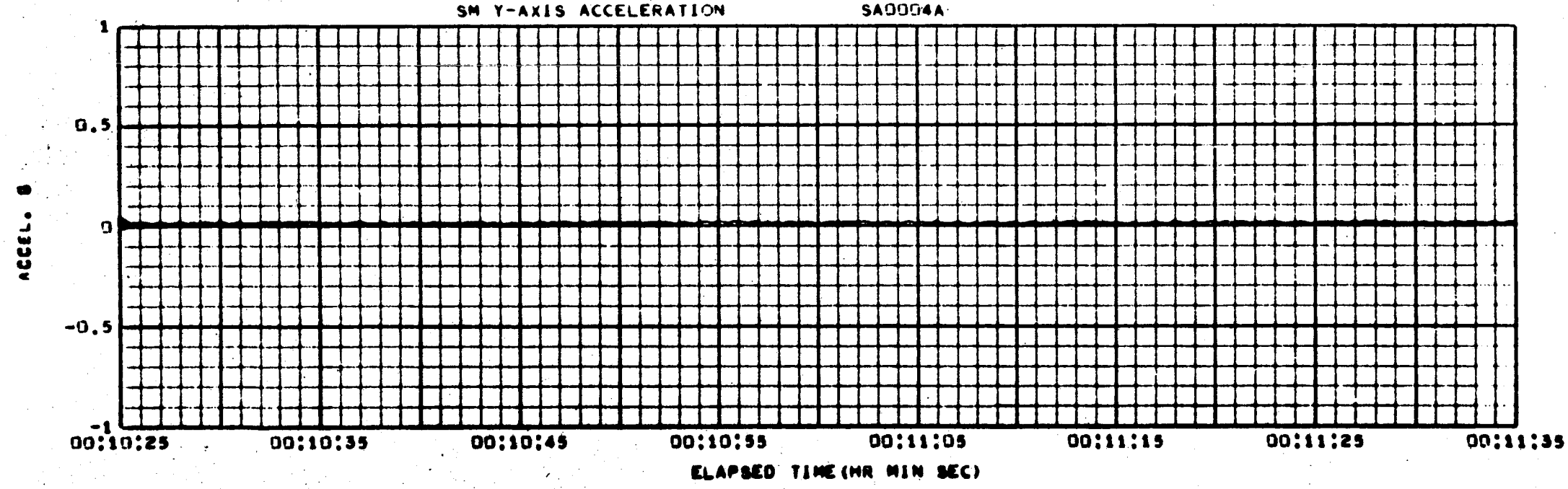

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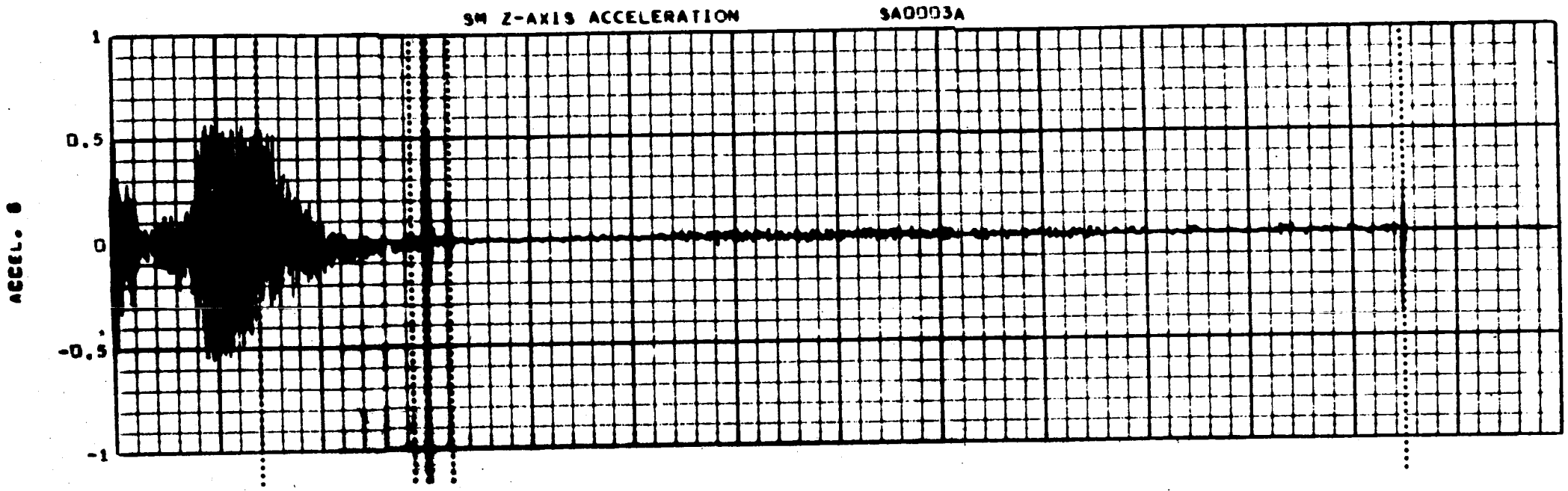
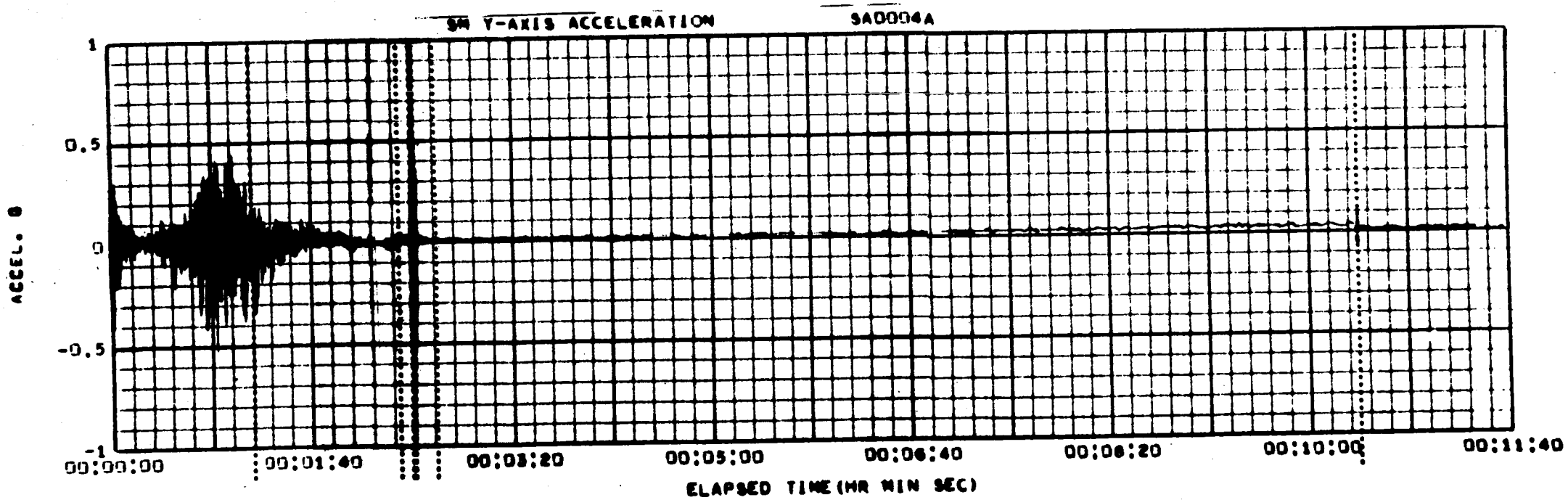
00:10:24.60 S-IV BURNOUT





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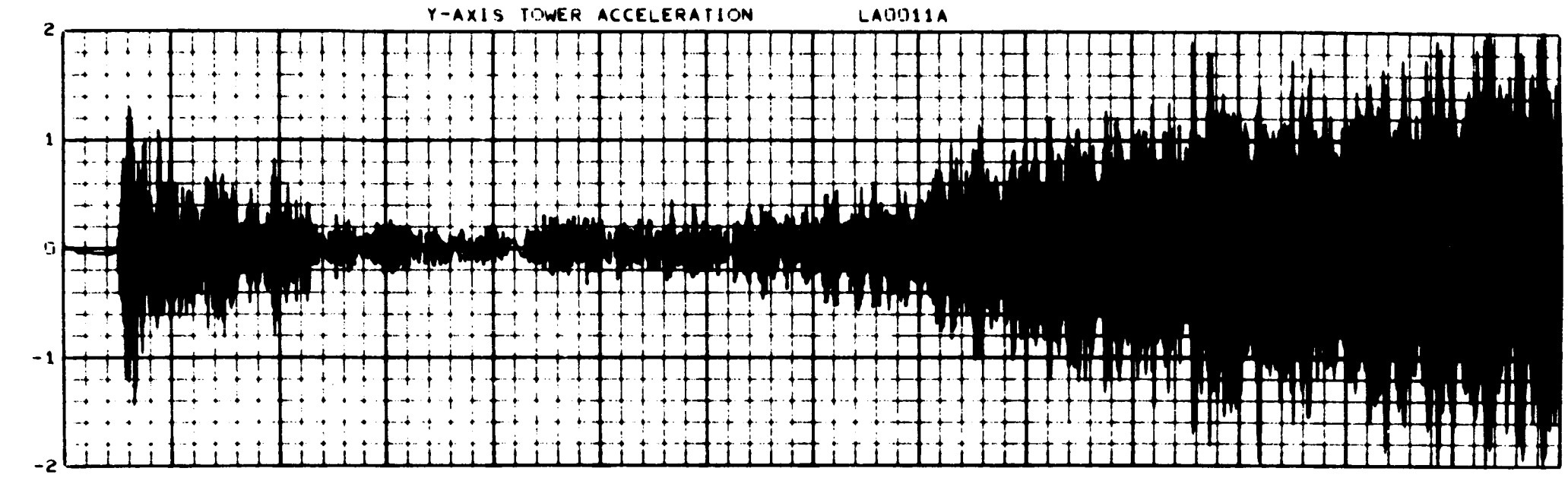

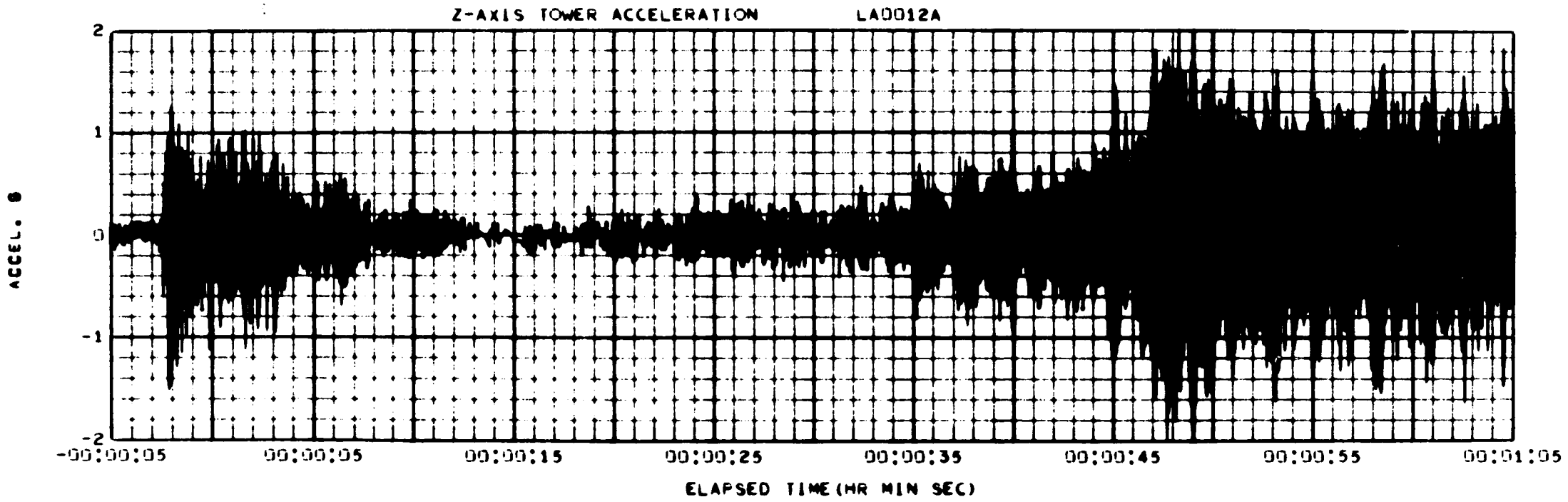

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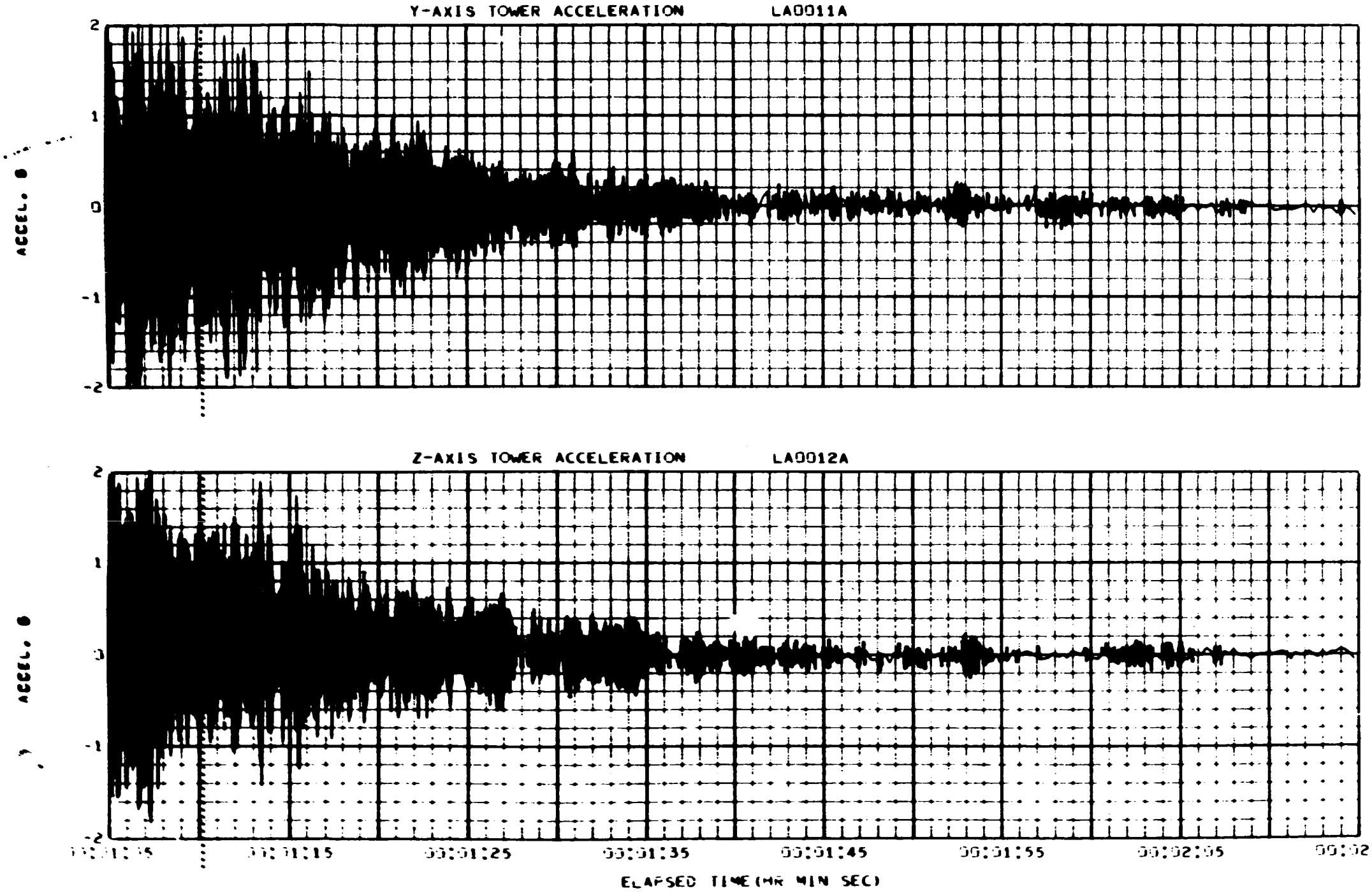
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ACCEL. G
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ELAPSED TIME(HR MIN SEC)

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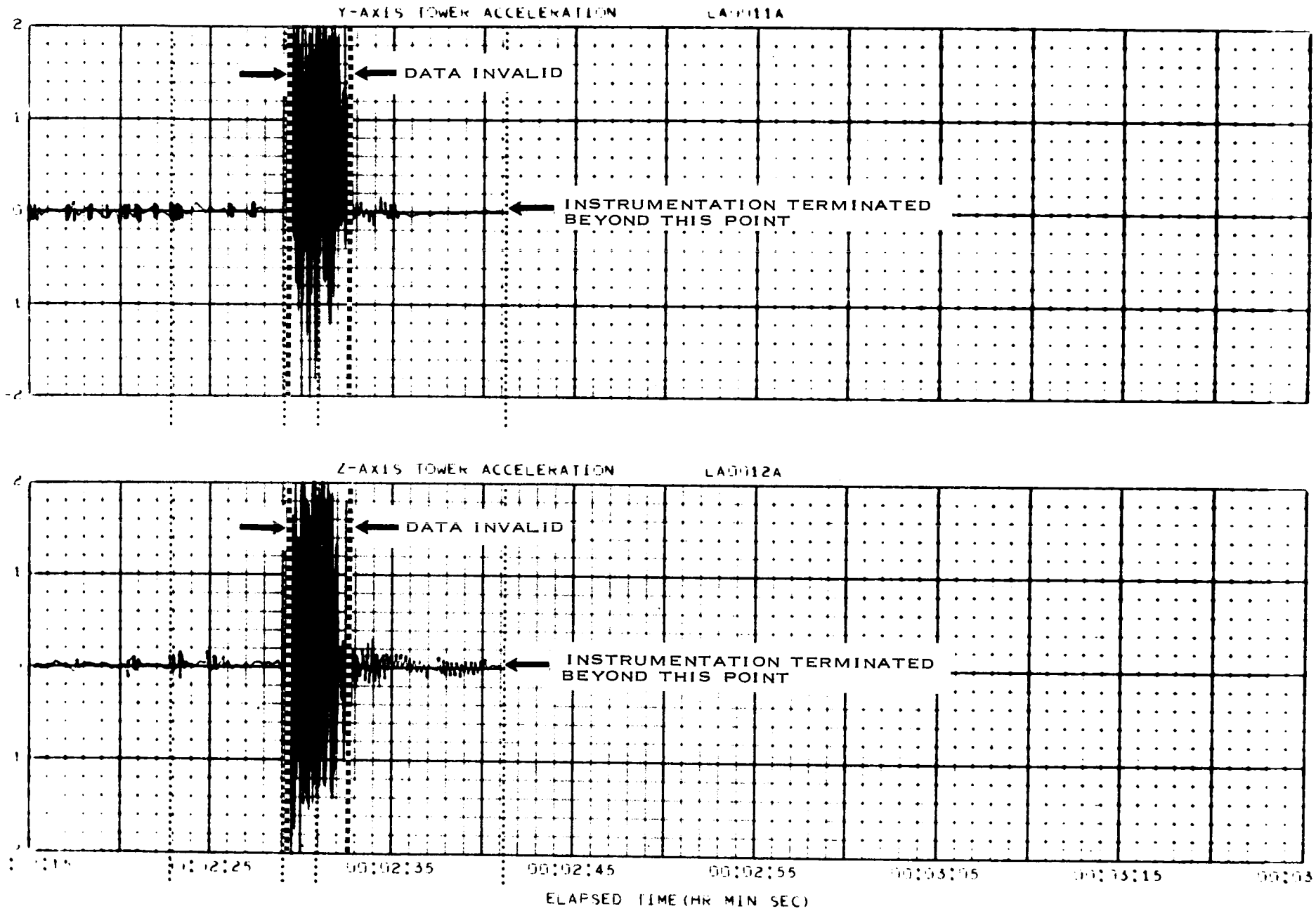
APOLLO SE-13

CONFIDENTIAL



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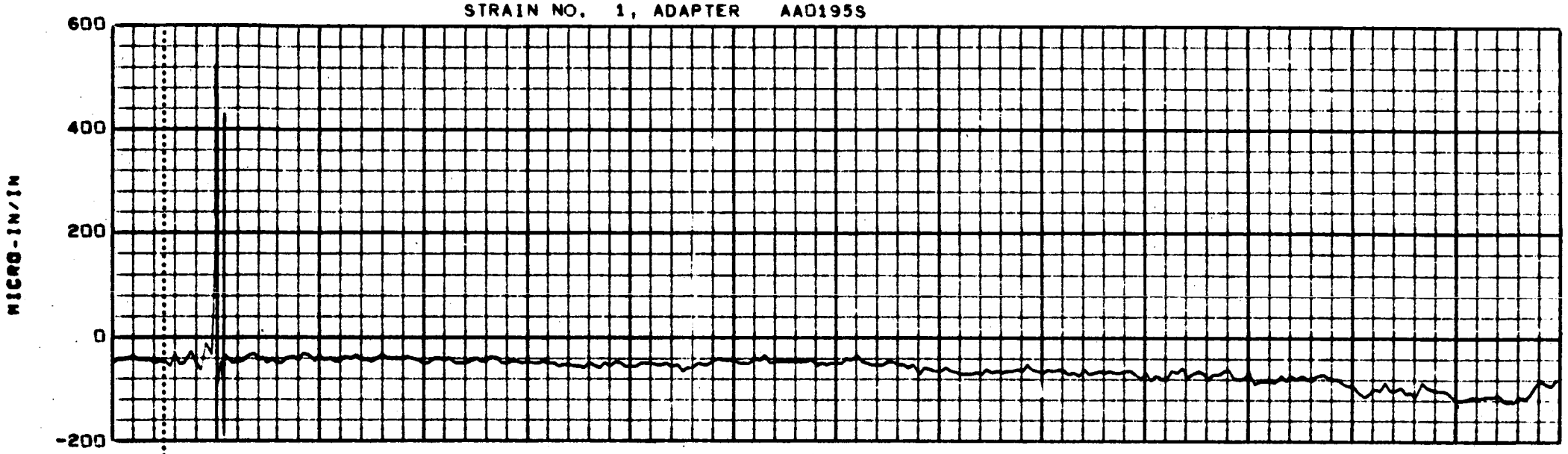

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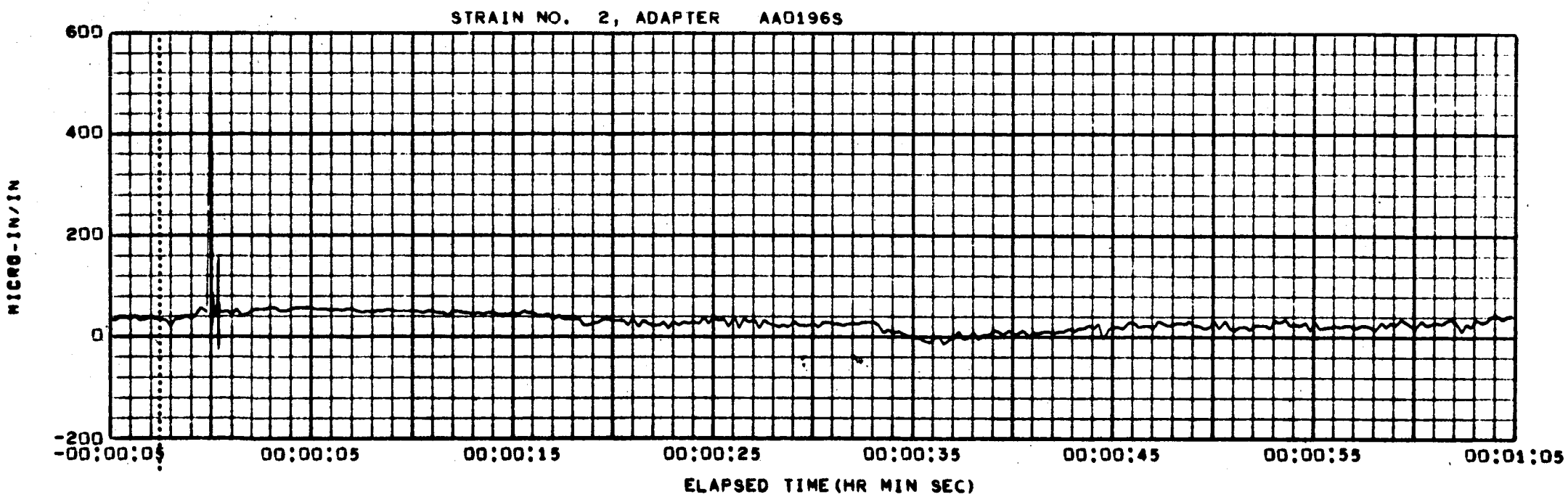

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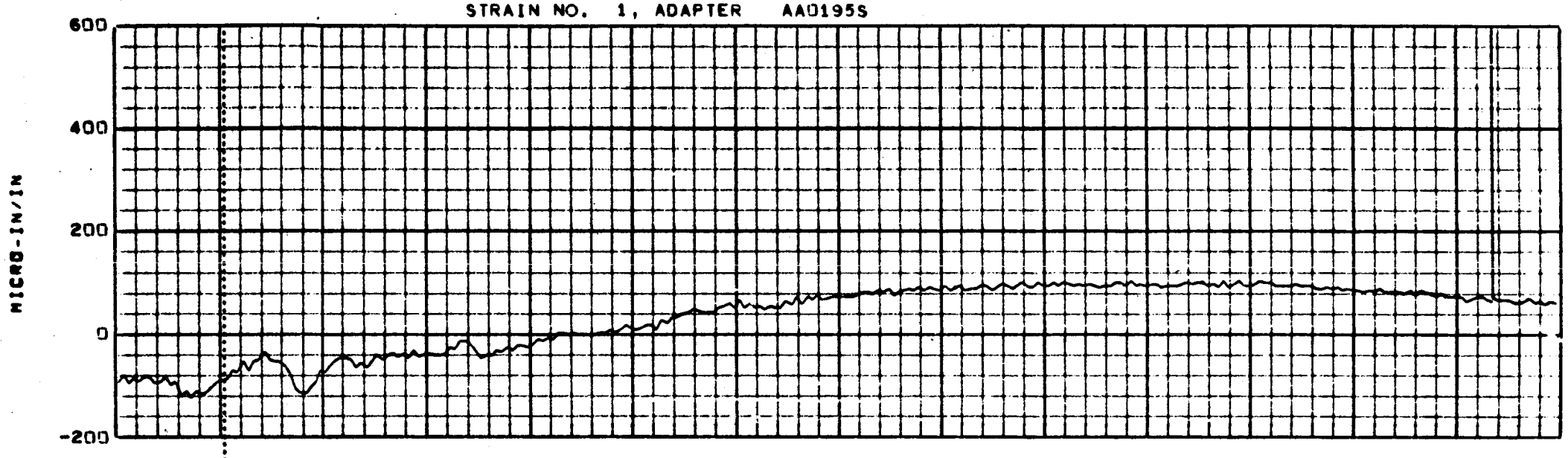

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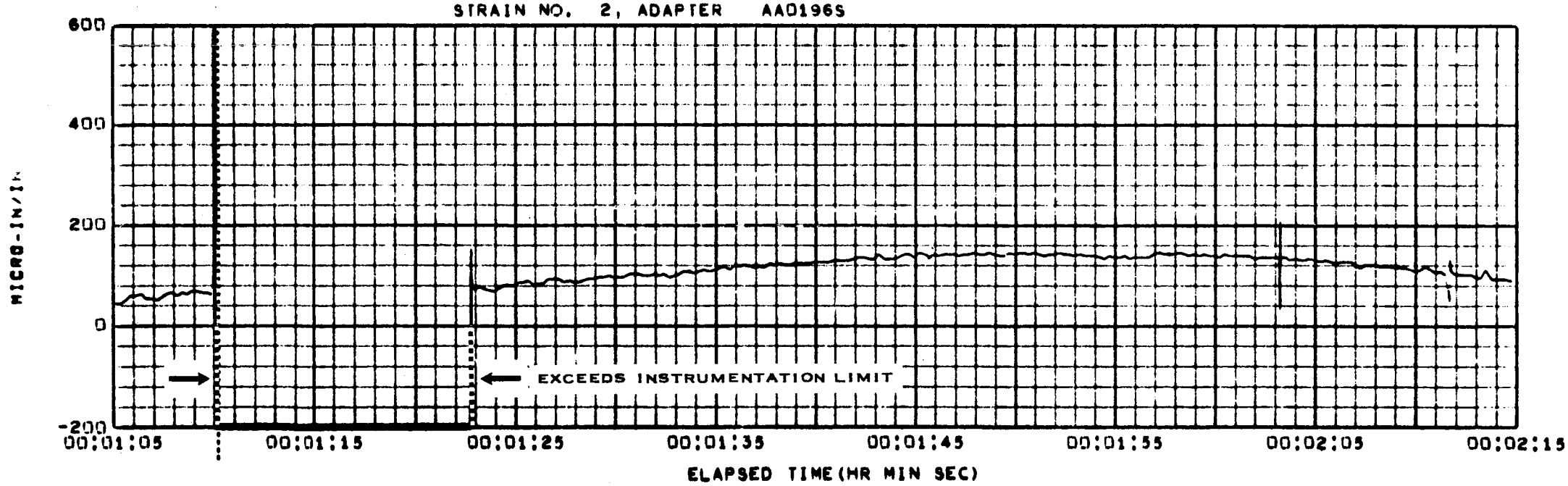

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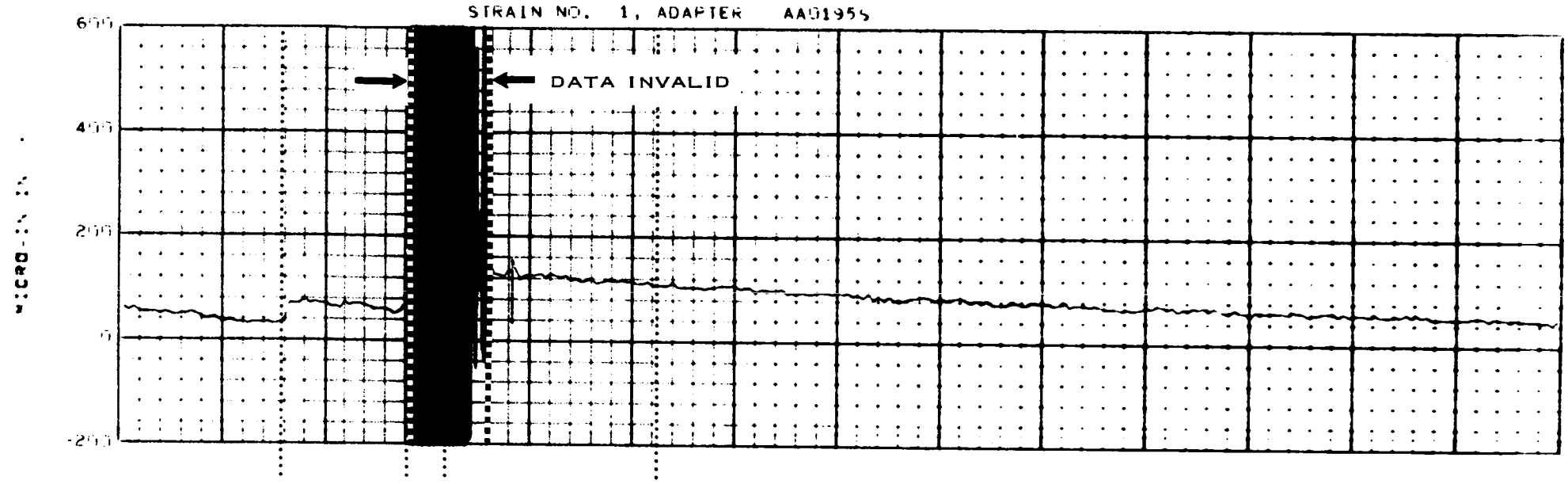
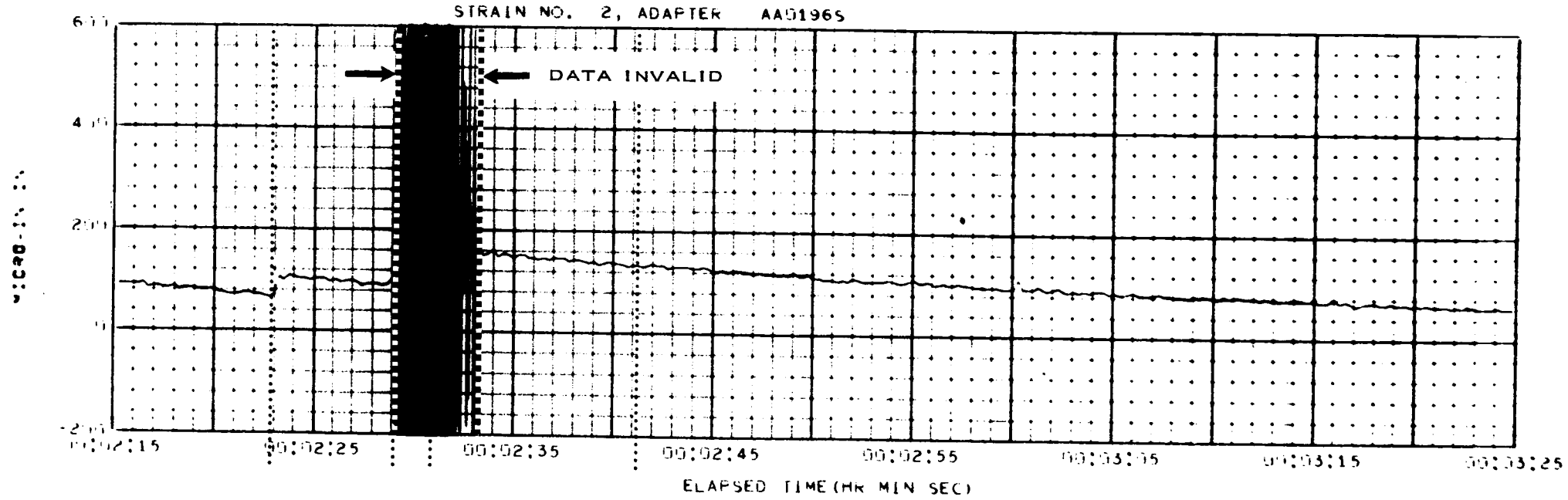
00:02:31.99 S-IV IGNITION
00:02:41.29 POWER JETTISON

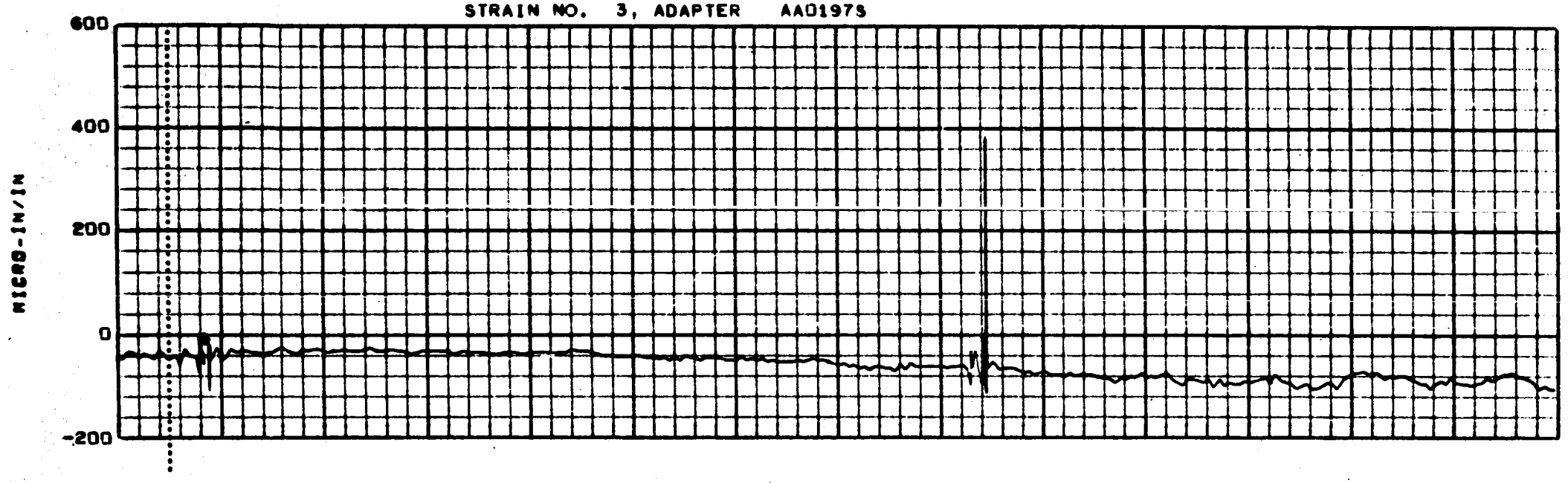
~~CONFIDENTIAL~~



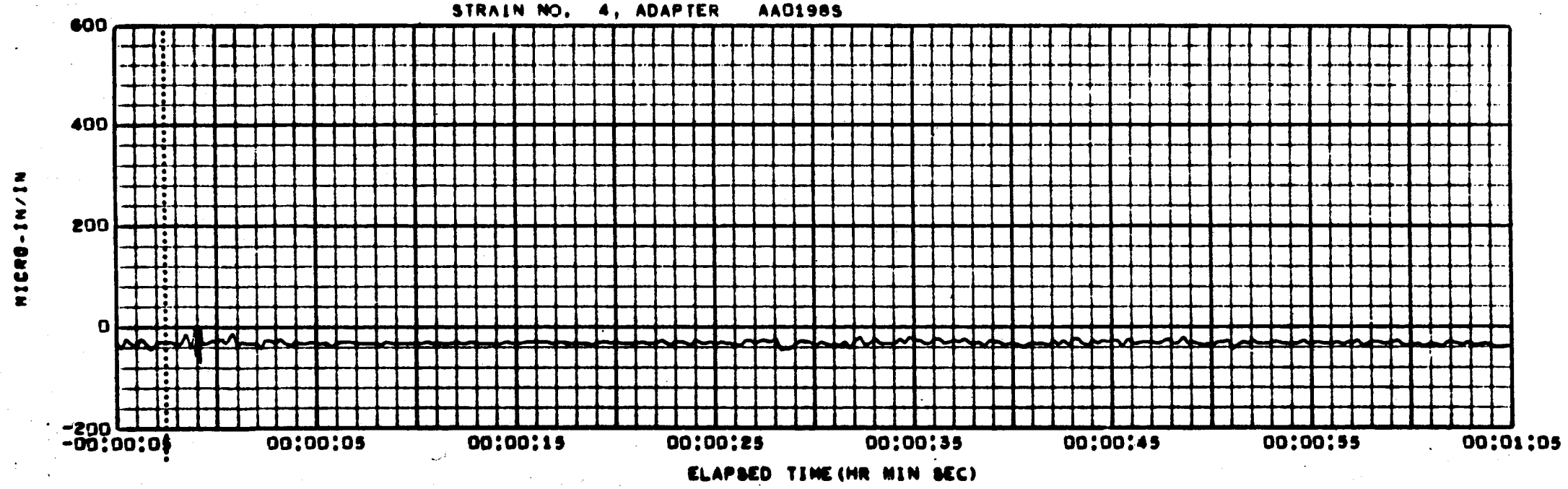


~~CONFIDENTIAL~~

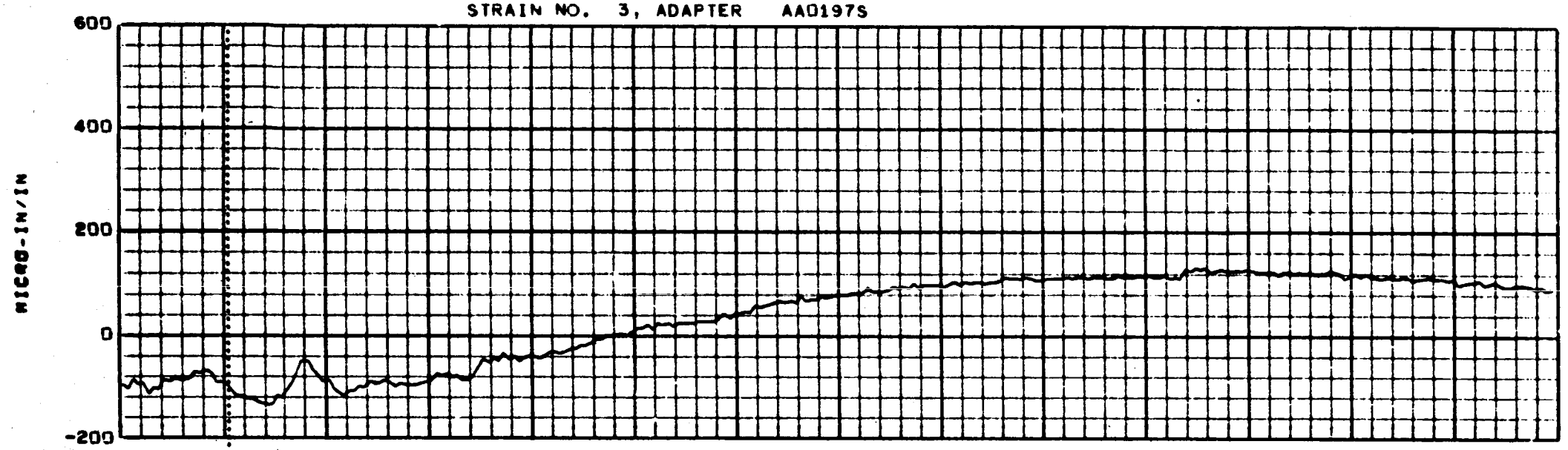
STRAIN NO. 3, ADAPTER AA01973



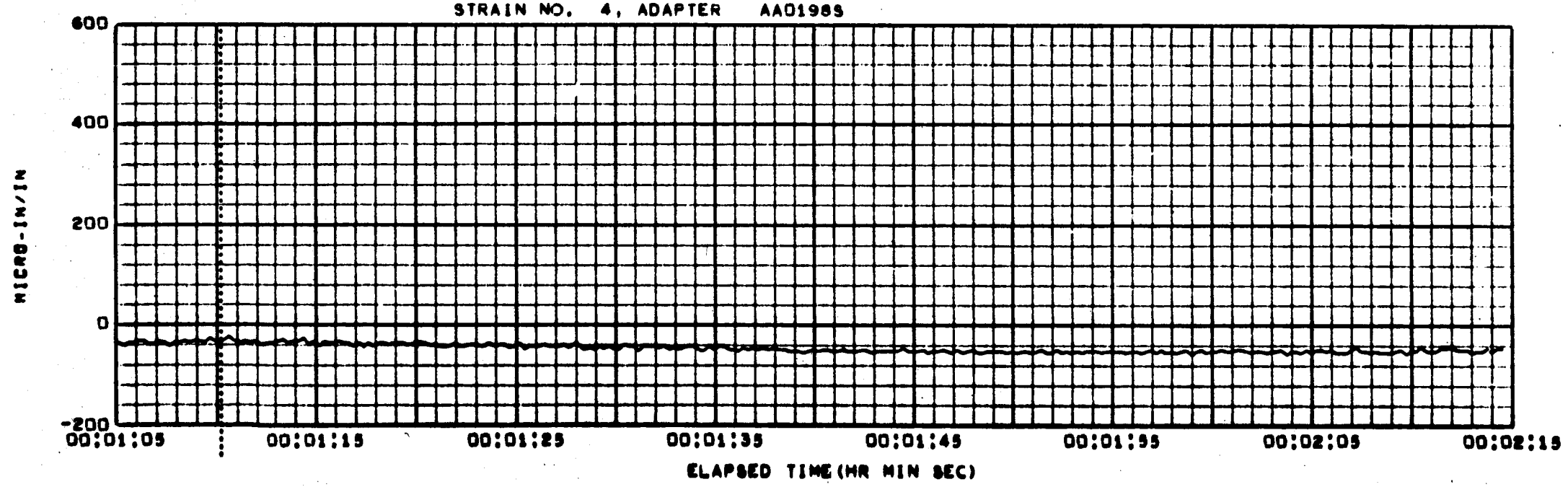
STRAIN NO. 4, ADAPTER AA01983



STRAIN NO. 3, ADAPTER AA0197S



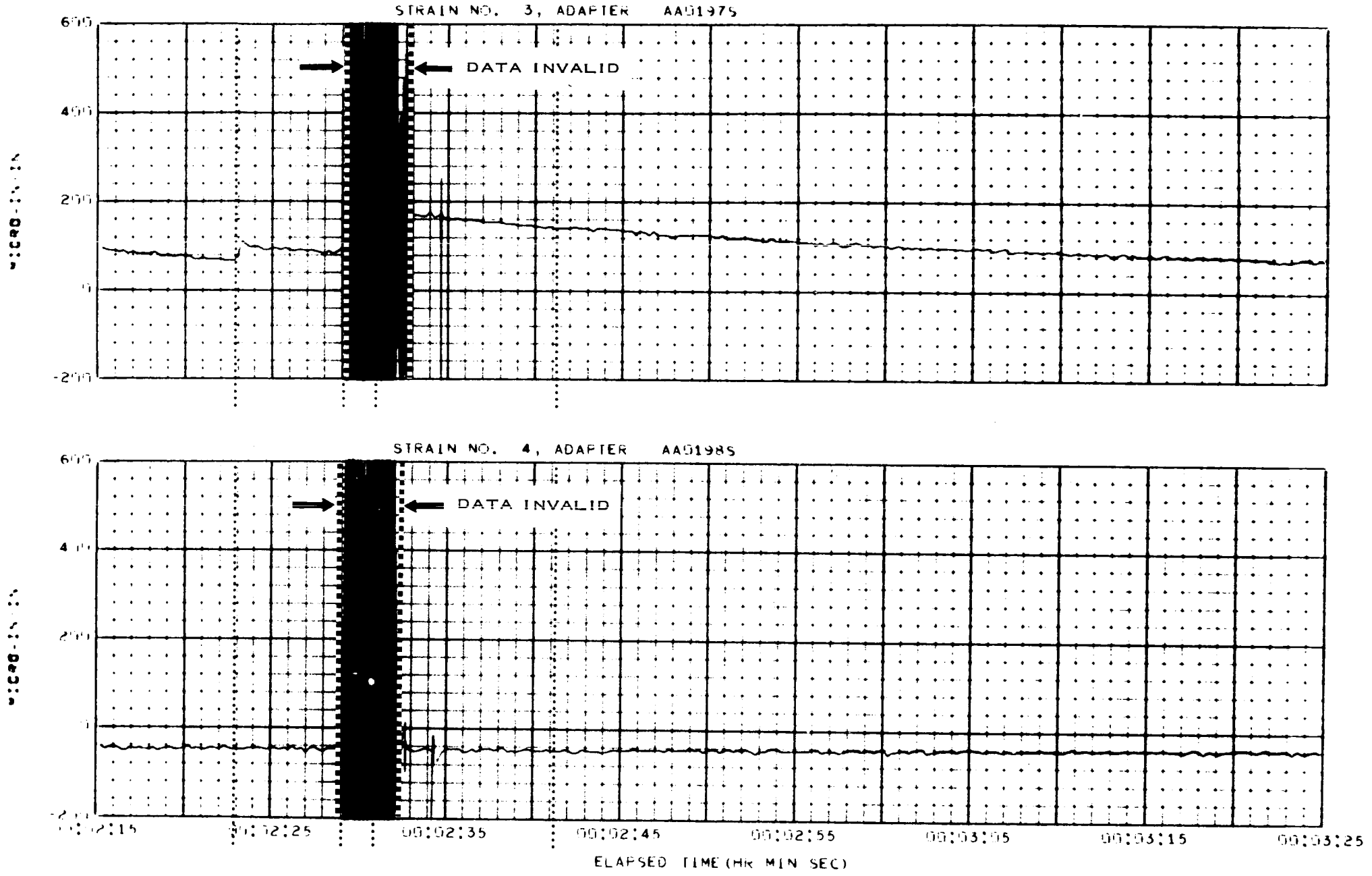
STRAIN NO. 4, ADAPTER AA0198S



00:02:22.88 S-I INBD.ENG. CUT-OFF
00:02:29.08 S-I CUT-OFF
00:02:35.95 S-IV IGNITION
00:02:41.20 TOWER JETTISON

APOLLO SP-13

~~CONFIDENTIAL~~



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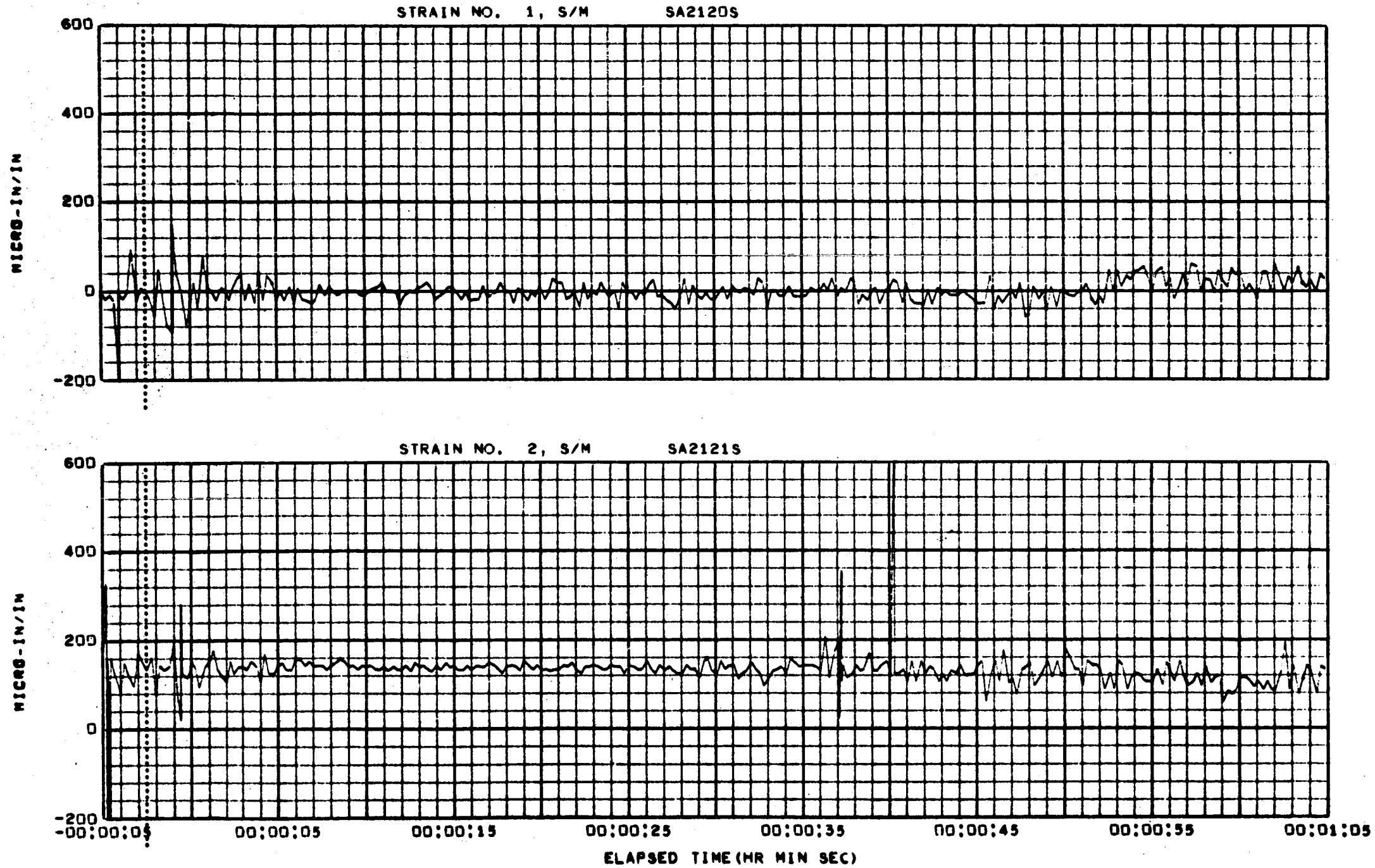
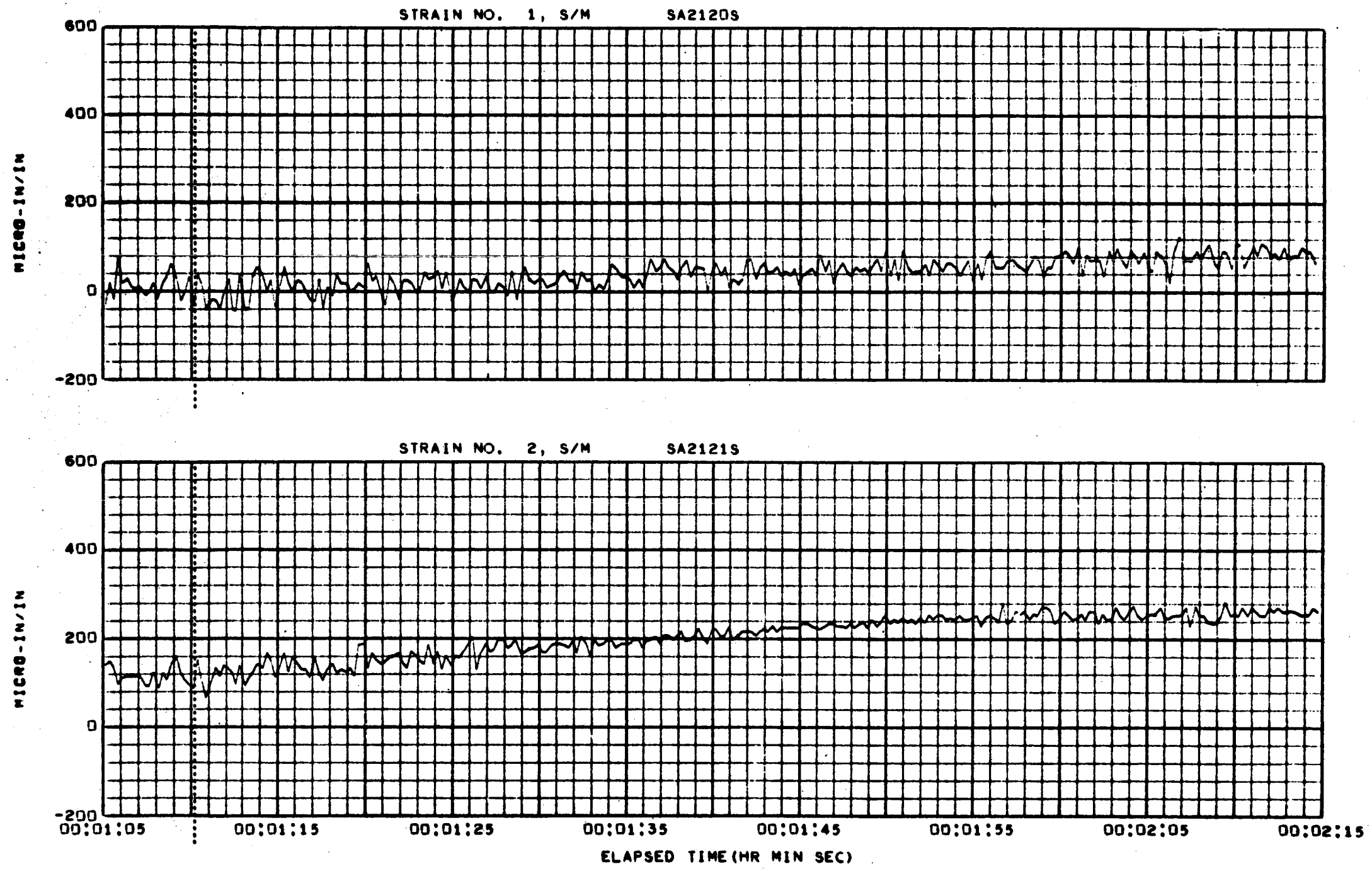

STRAIN NO. 1, S/M SA2120S
600
400
200
0
-200
MICRO-IN/IN
STRAIN NO. 2, S/M SA2121S
600
400
200
0
-200
MICRO-IN/IN
-00:00:05
00:00:05
00:00:15
00:00:25
00:00:35
00:00:45
00:00:55
00:01:05
ELAPSED TIME (HR MIN SEC)

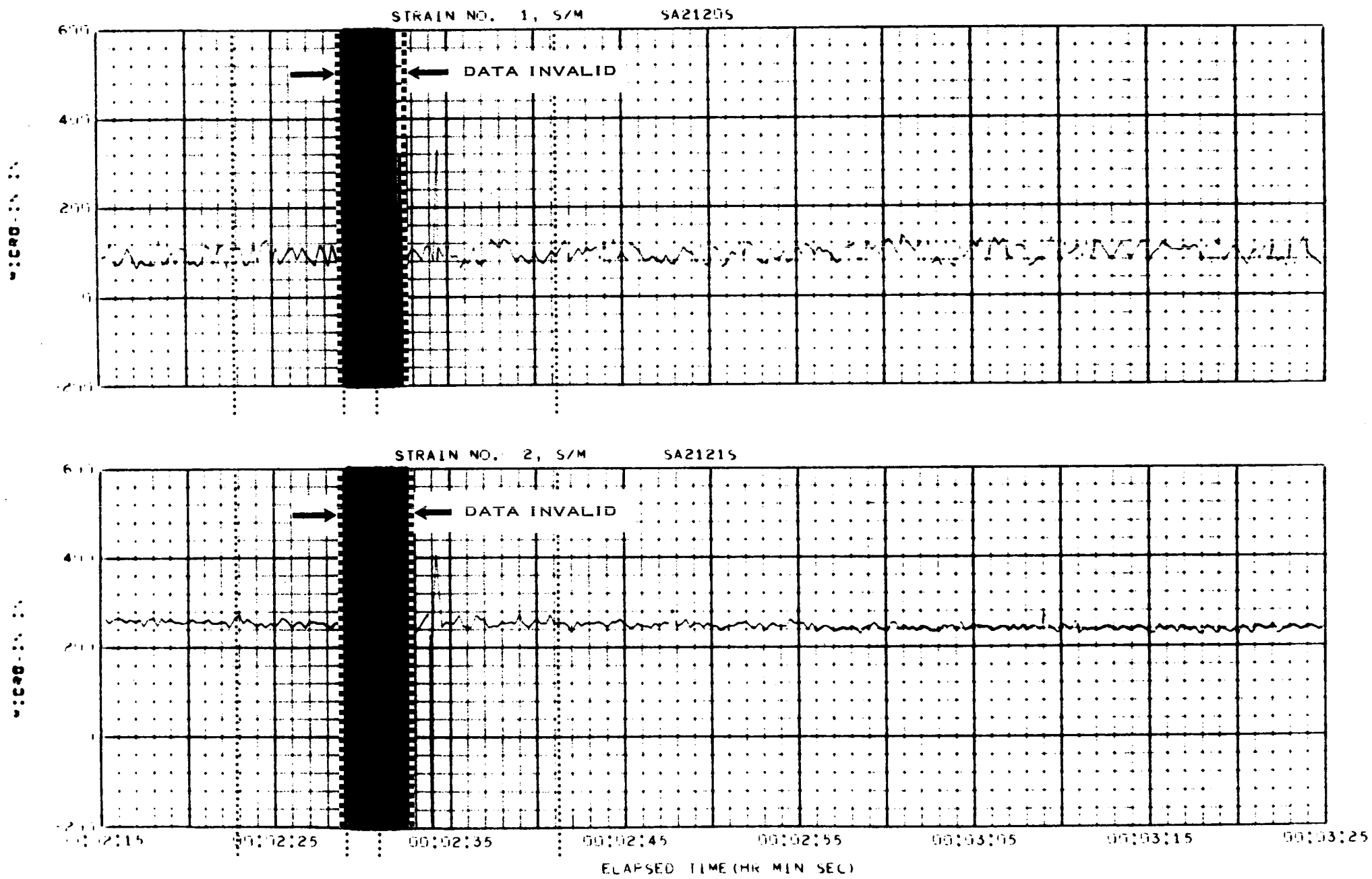
~~CONFIDENTIAL~~



~~CONFIDENTIAL~~

CONFIDENTIAL

00:02:22.88 S-1 INBD.ENG. CUT-OFF
00:02:29.18 S-1 CUT-OFF
00:02:31.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

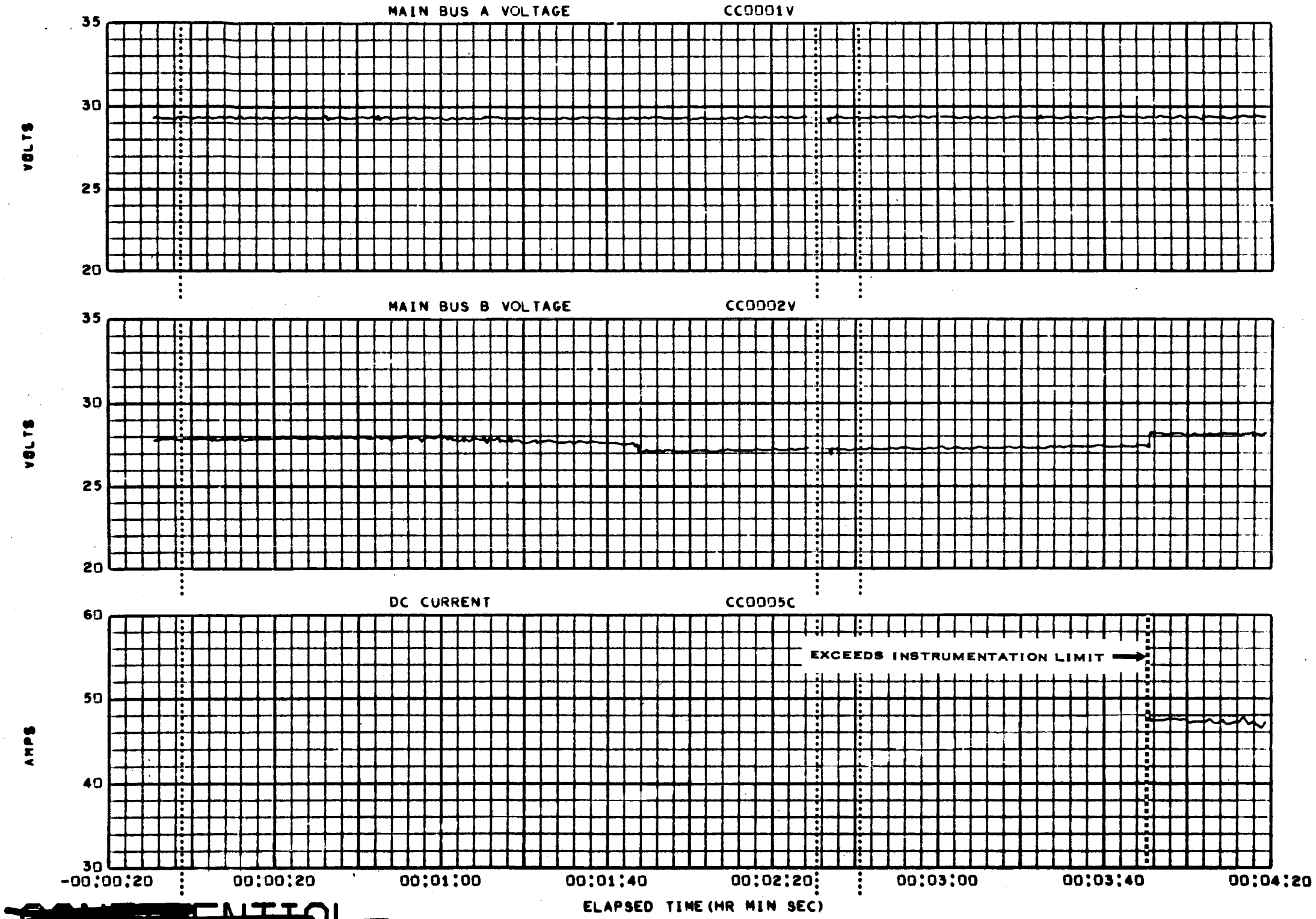


CONFIDENTIAL

-00:00:02.55 S-I IGNITION
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

APOLLO BP-13

~~CONFIDENTIAL~~

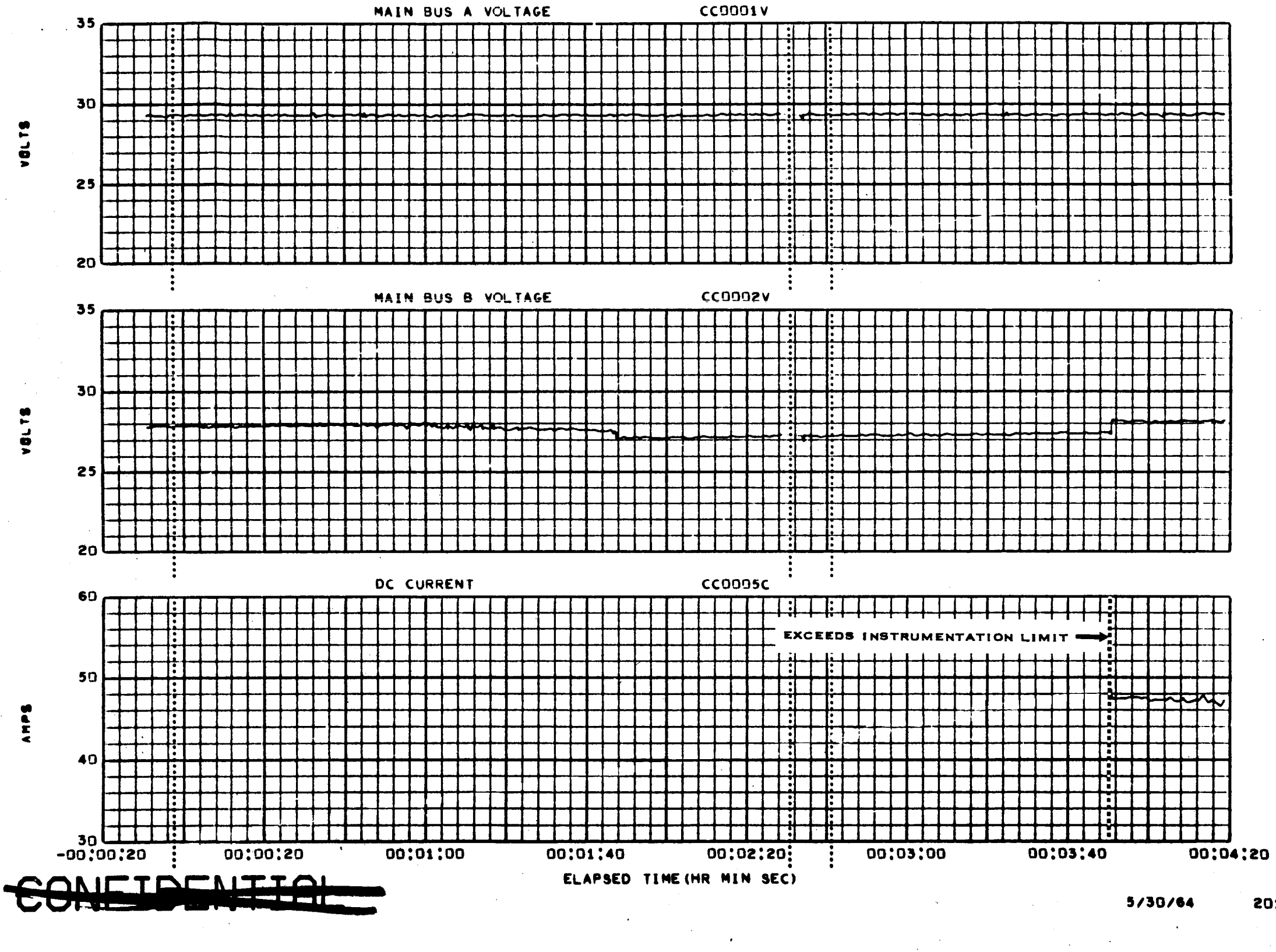


~~CONFIDENTIAL~~

-00:00:02.55 S-I IGNITION
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

APOLLO BP-13

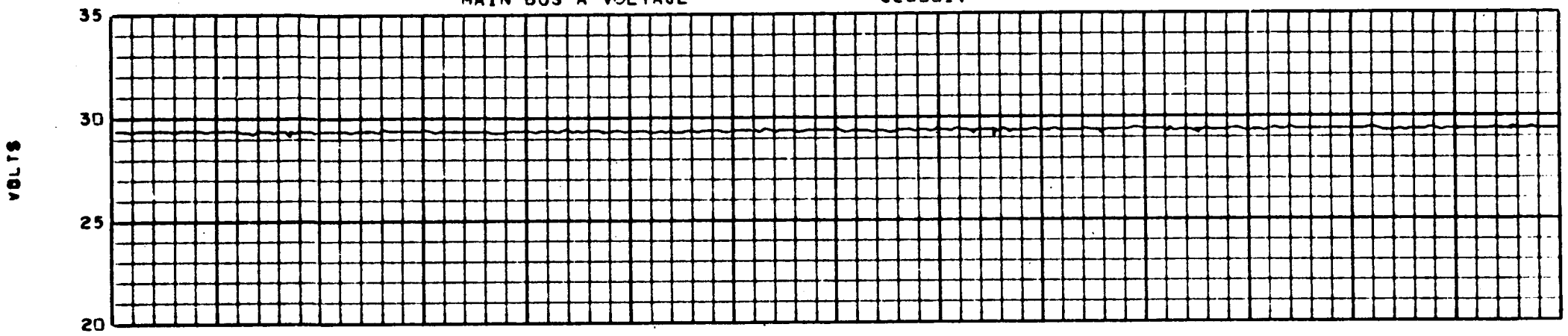
~~CONFIDENTIAL~~



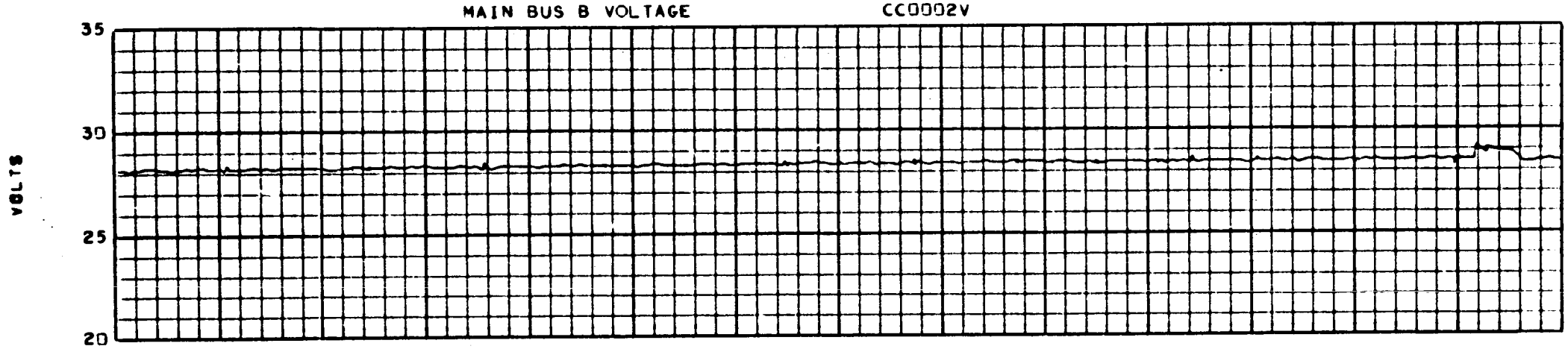
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

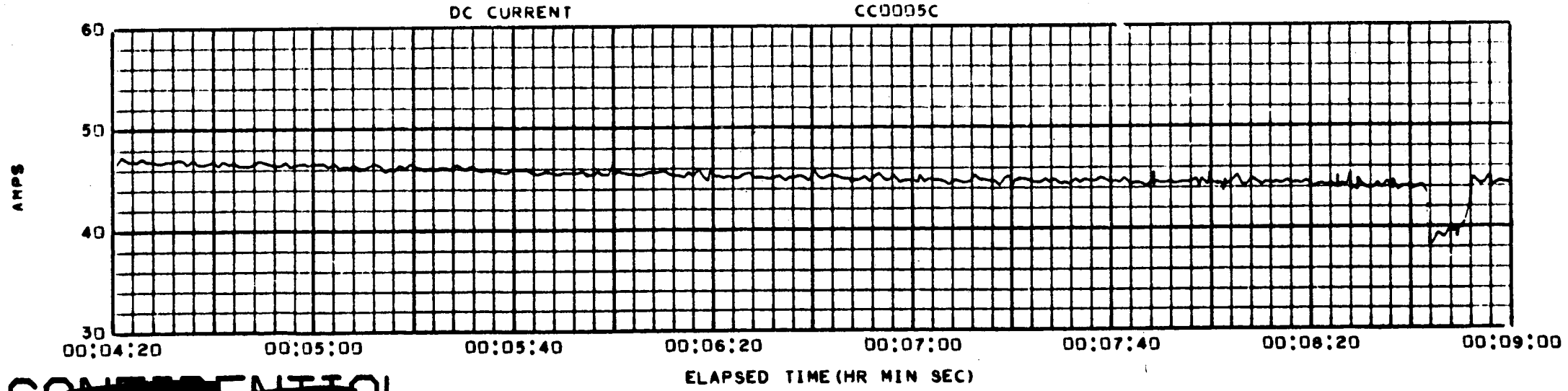
MAIN BUS A VOLTAGE CC0001V



MAIN BUS B VOLTAGE CC0002V



DC CURRENT CC0005C



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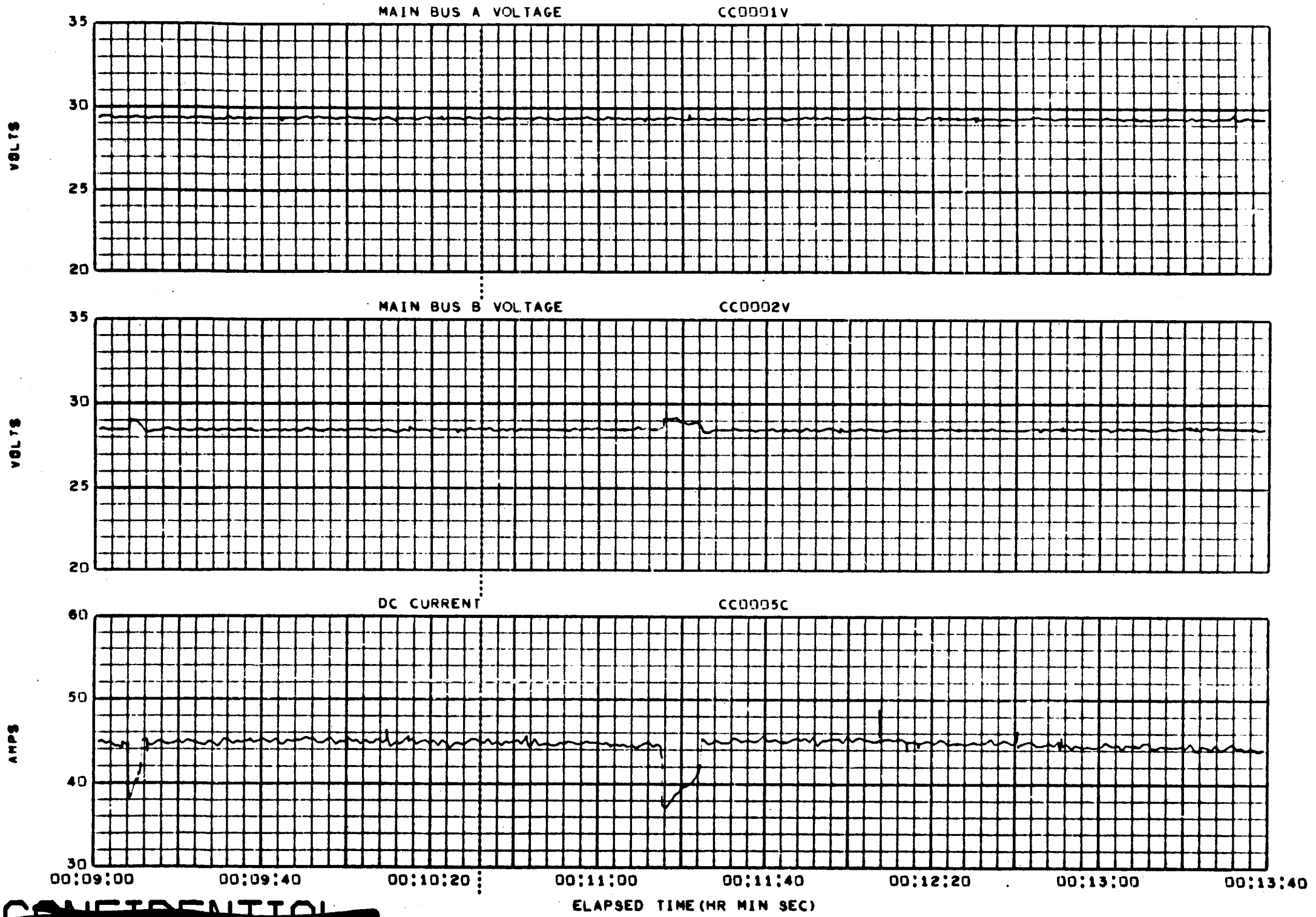
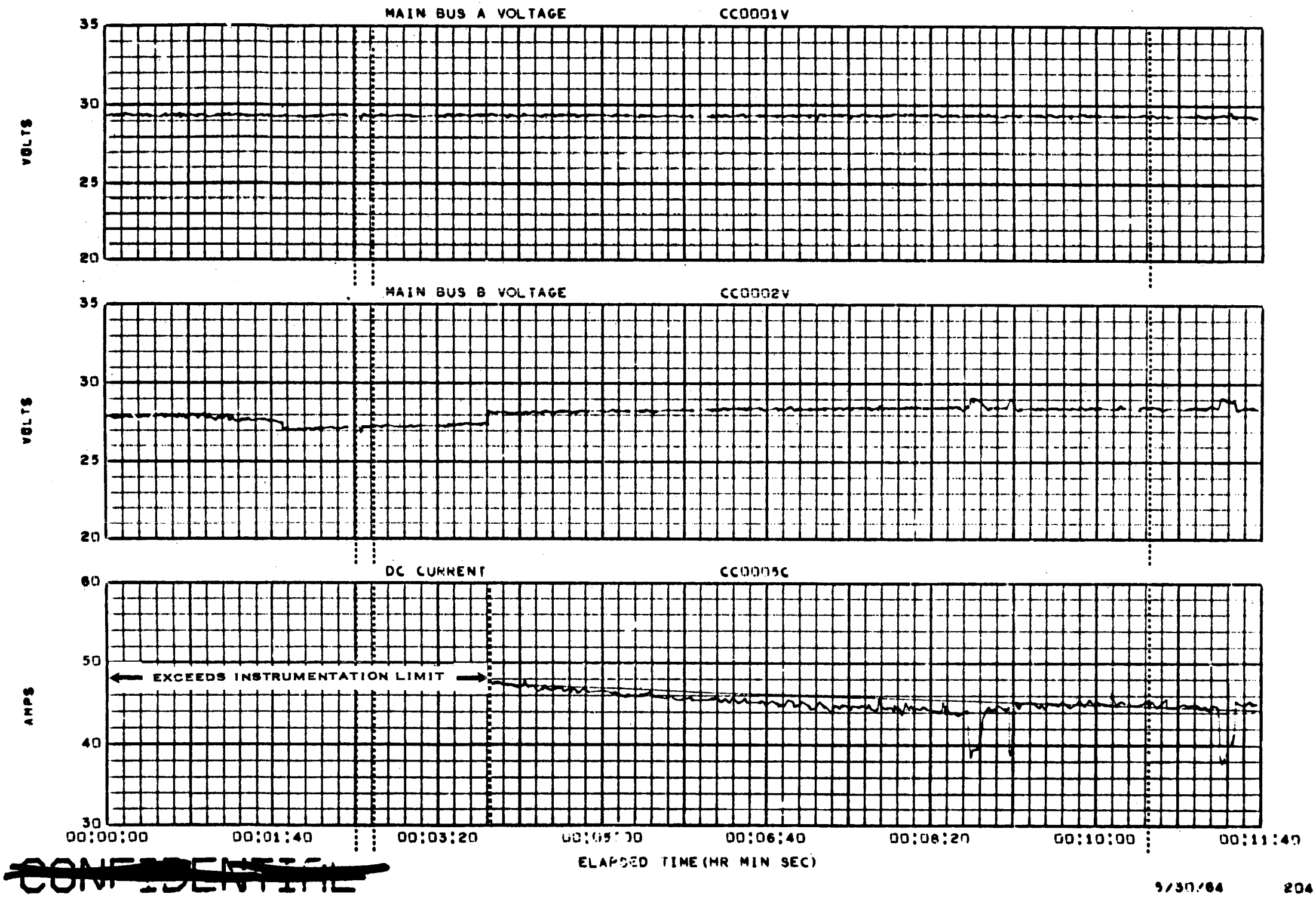

MAIN BUS A VOLTAGE
CC0001V
35
30
25
20
VOLTS
MAIN BUS B VOLTAGE
CC0002V
35
30
25
20
VOLTS
DC CURRENT
CC0005C
60
50
40
30
AMPS
00:09:00
00:09:40
00:10:20
00:11:00
00:11:40
00:12:20
00:13:00
00:13:40
ELAPSED TIME (HR MIN SEC)

00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:10:32.00 ORBIT INSERTION

APOLLO BP-13

[redacted]

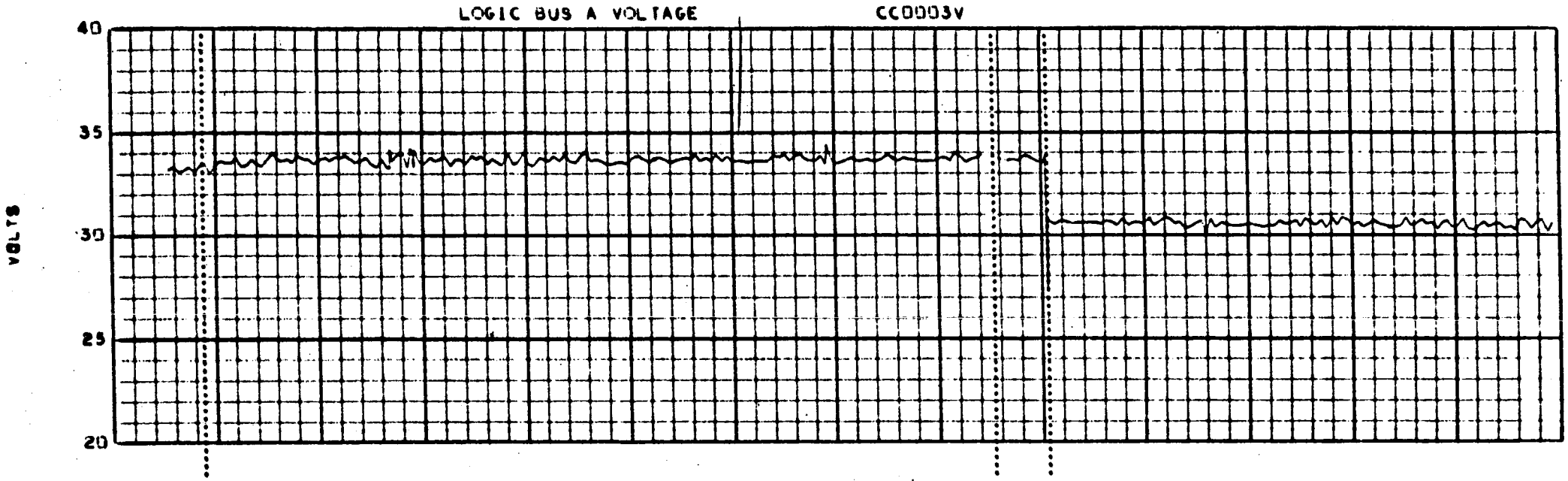


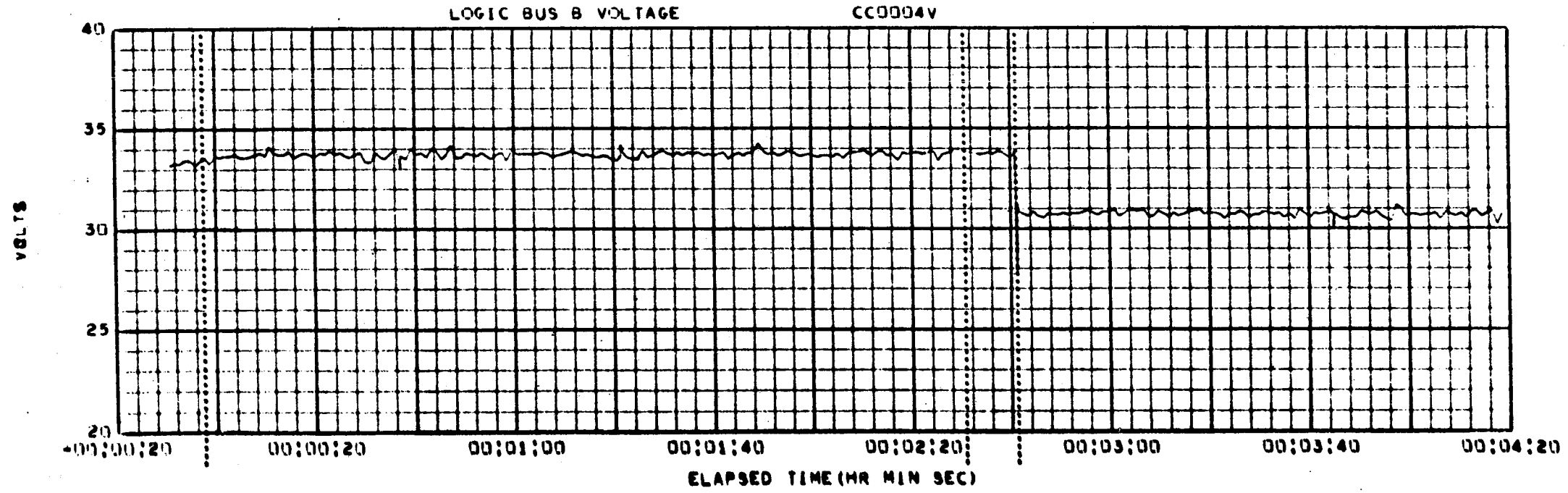
[redacted]

-00:00:02.55 S-I IGNITION
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

APOLLO BP-13

CONFIDENTIAL





CONFIDENTIAL

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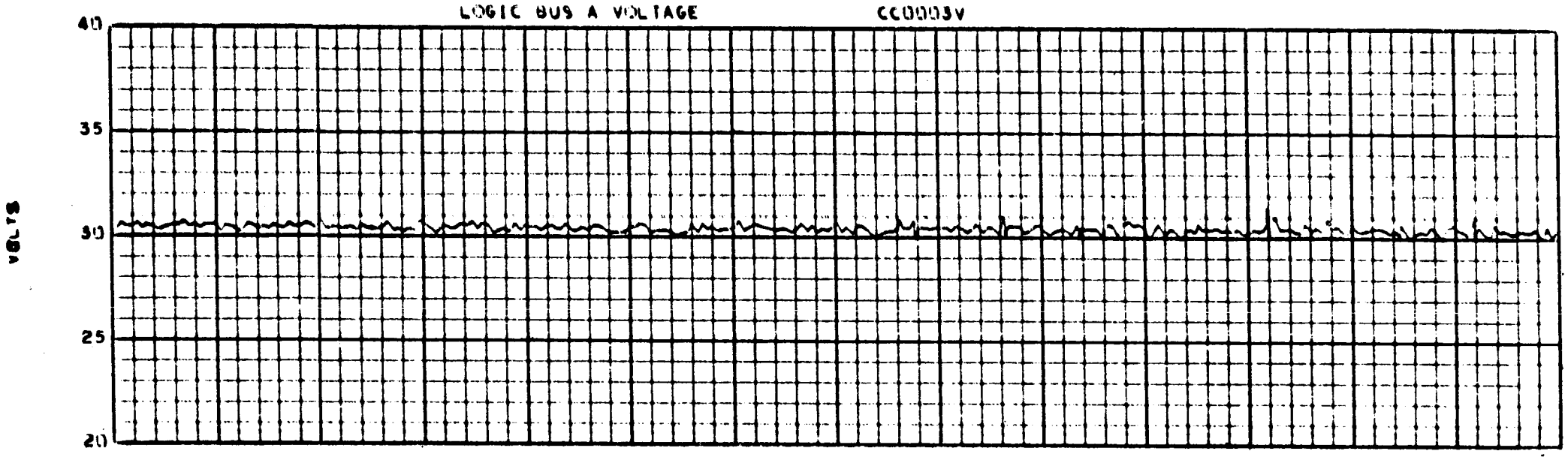

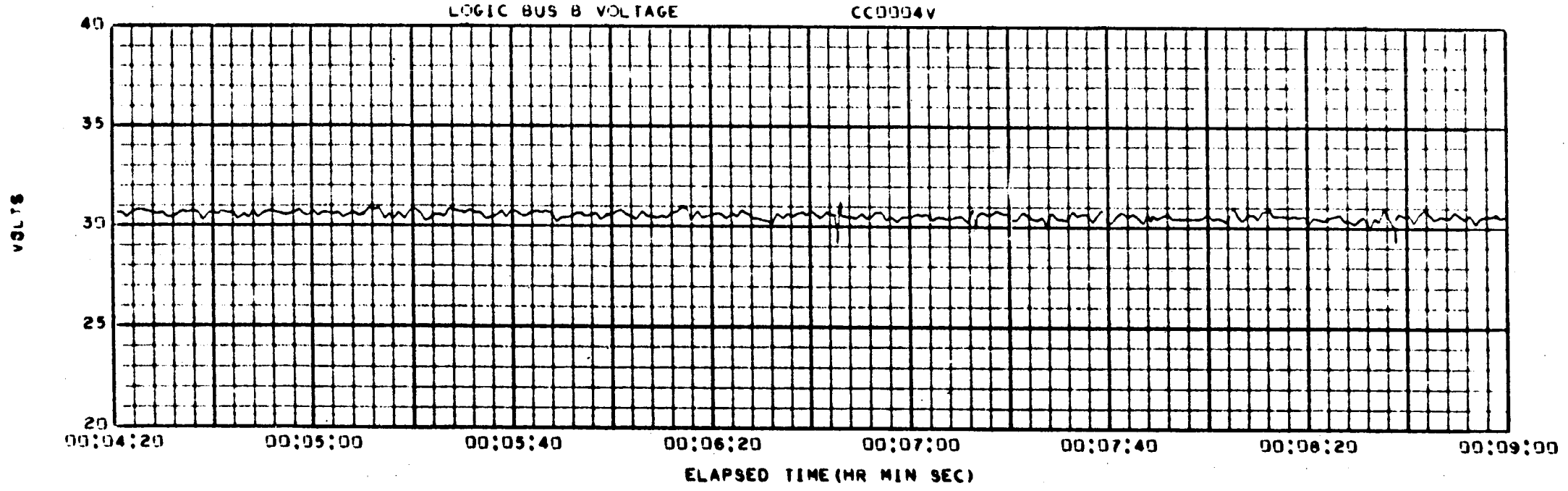

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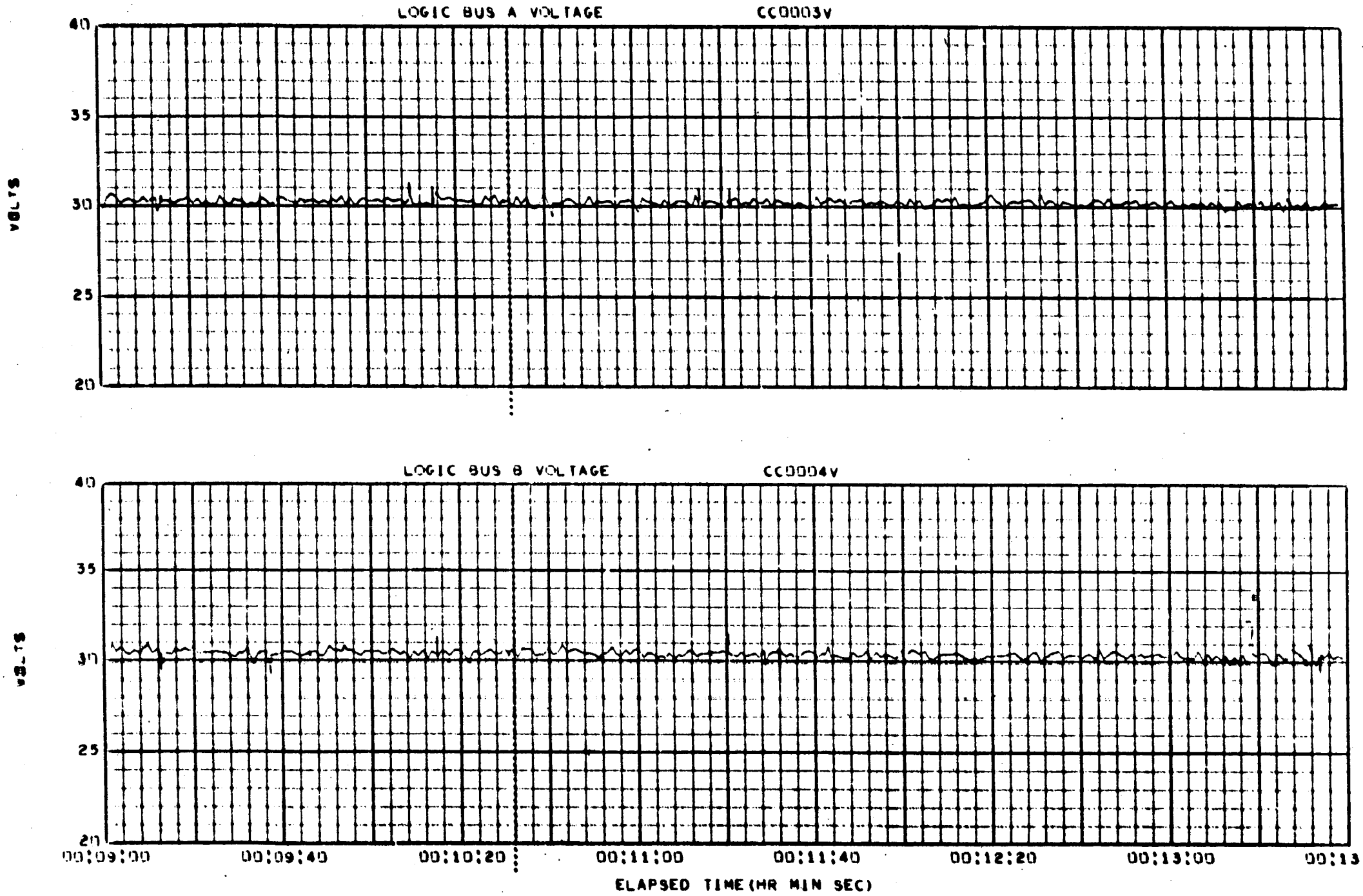
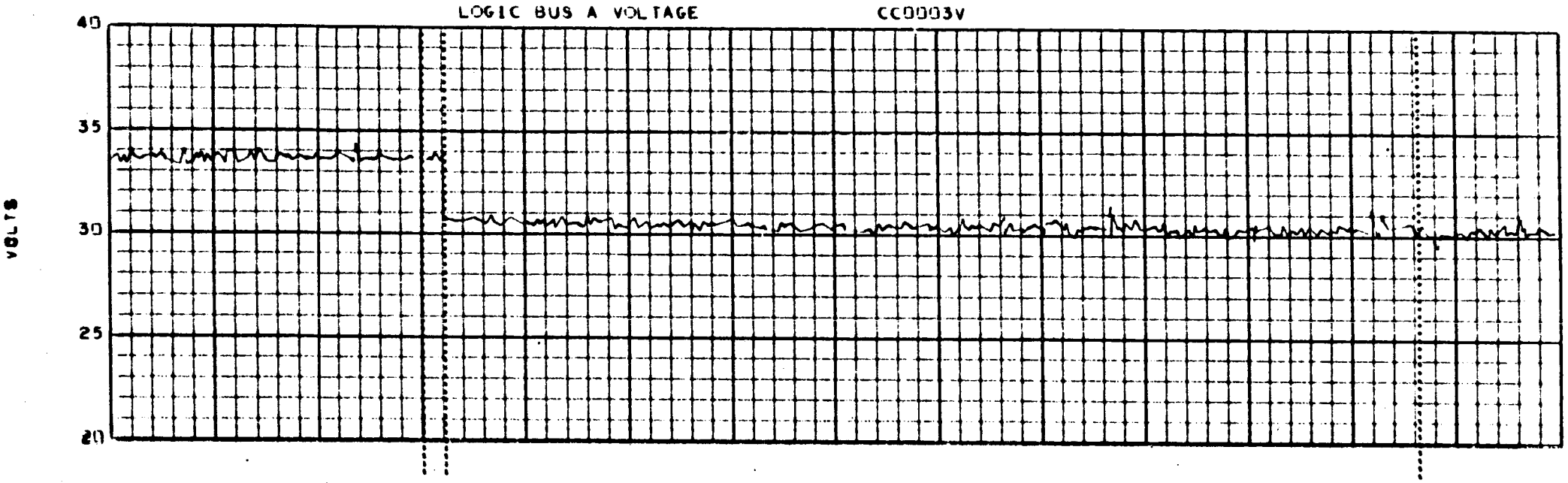
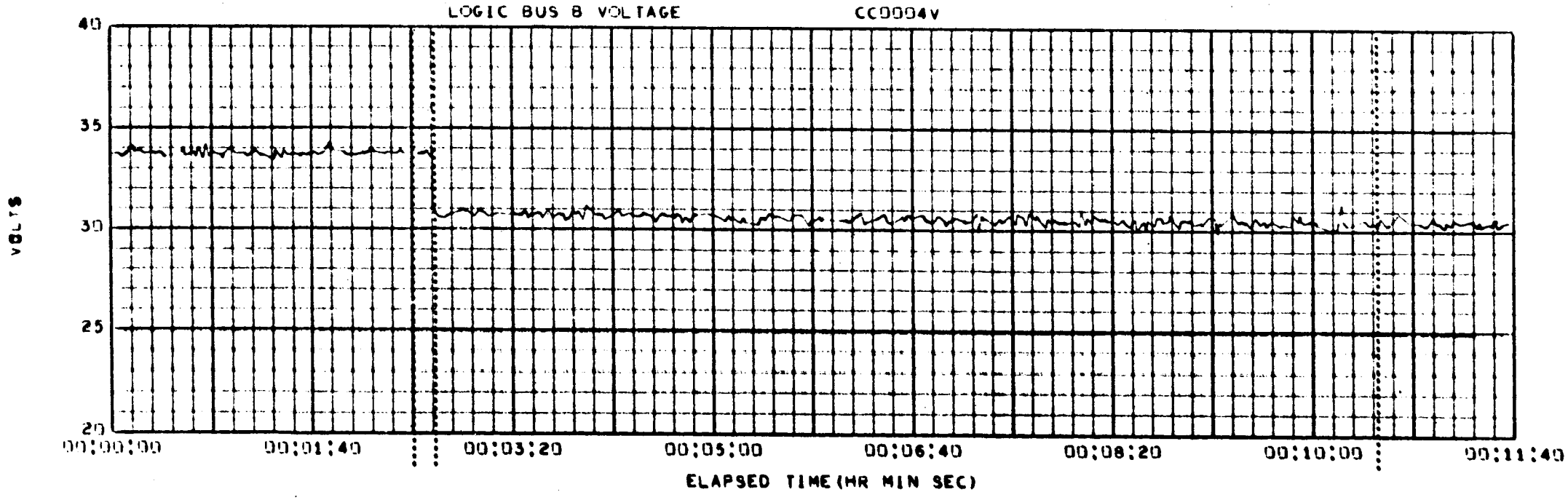

LOGIC BUS A VOLTAGE
CC0003V
LOGIC BUS B VOLTAGE
CC0004V
VOLTS
40
35
30
25
20
00:09:00
00:09:40
00:10:20
00:11:00
00:11:40
00:12:20
00:13:00
00:13:40
ELAPSED TIME(HR MIN SEC)

00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:10:32.00 ORBIT INSERTION

~~CONFIDENTIAL~~



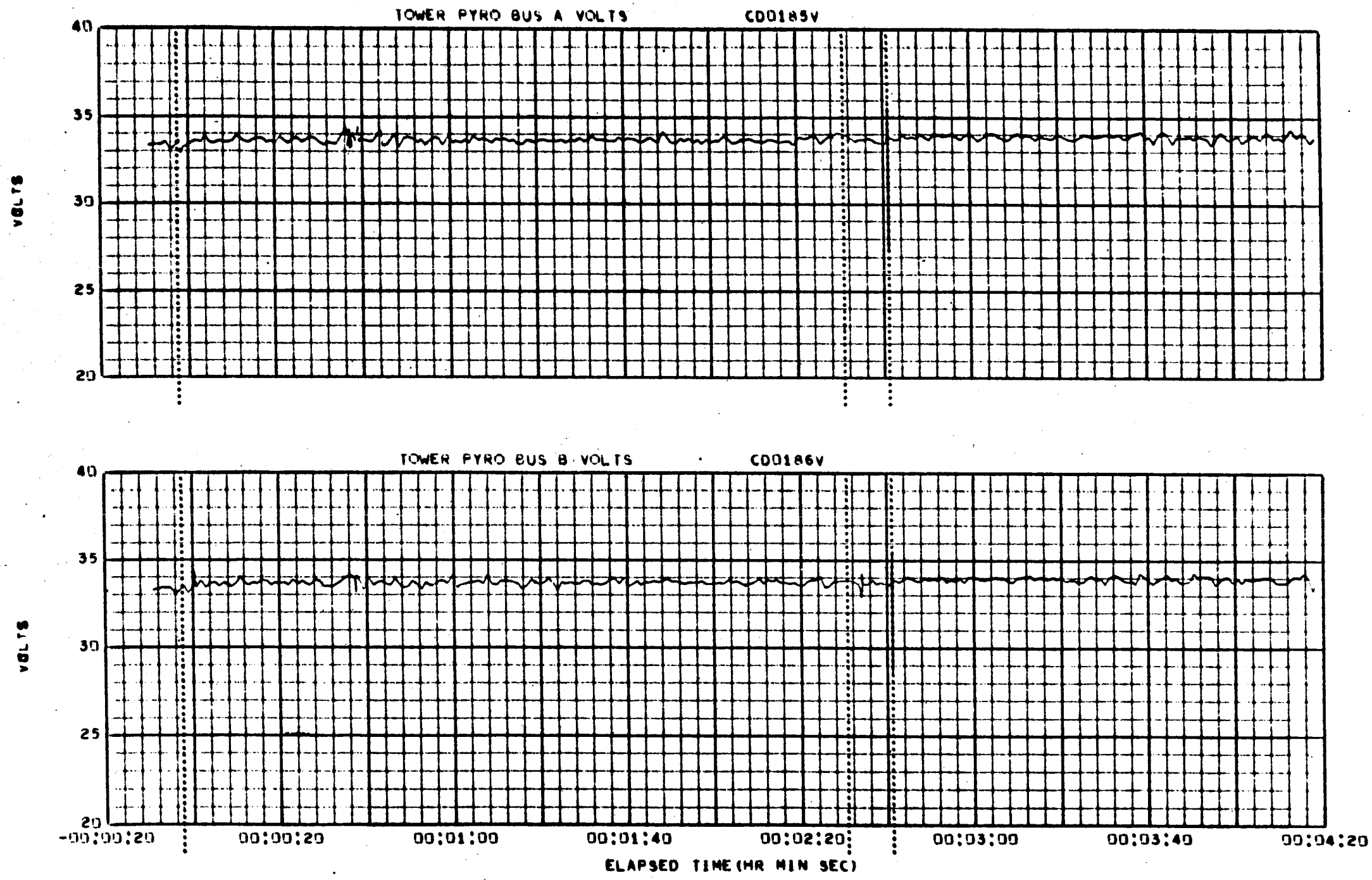


~~CONFIDENTIAL~~

-00:00:02.55 S-I IGNITION
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

APOLLO BP-13

~~CONFIDENTIAL~~



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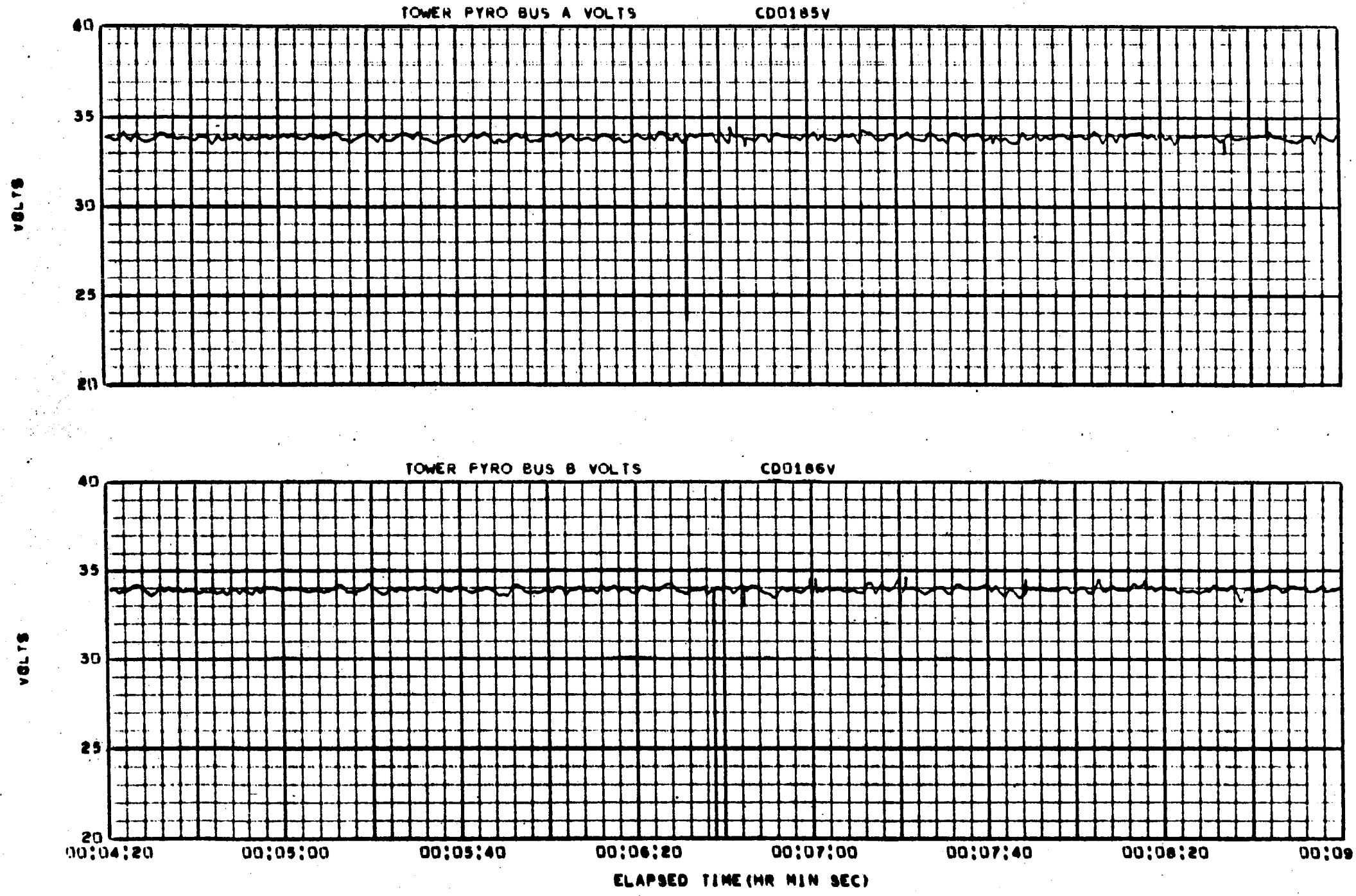
CONFIDENTIAL



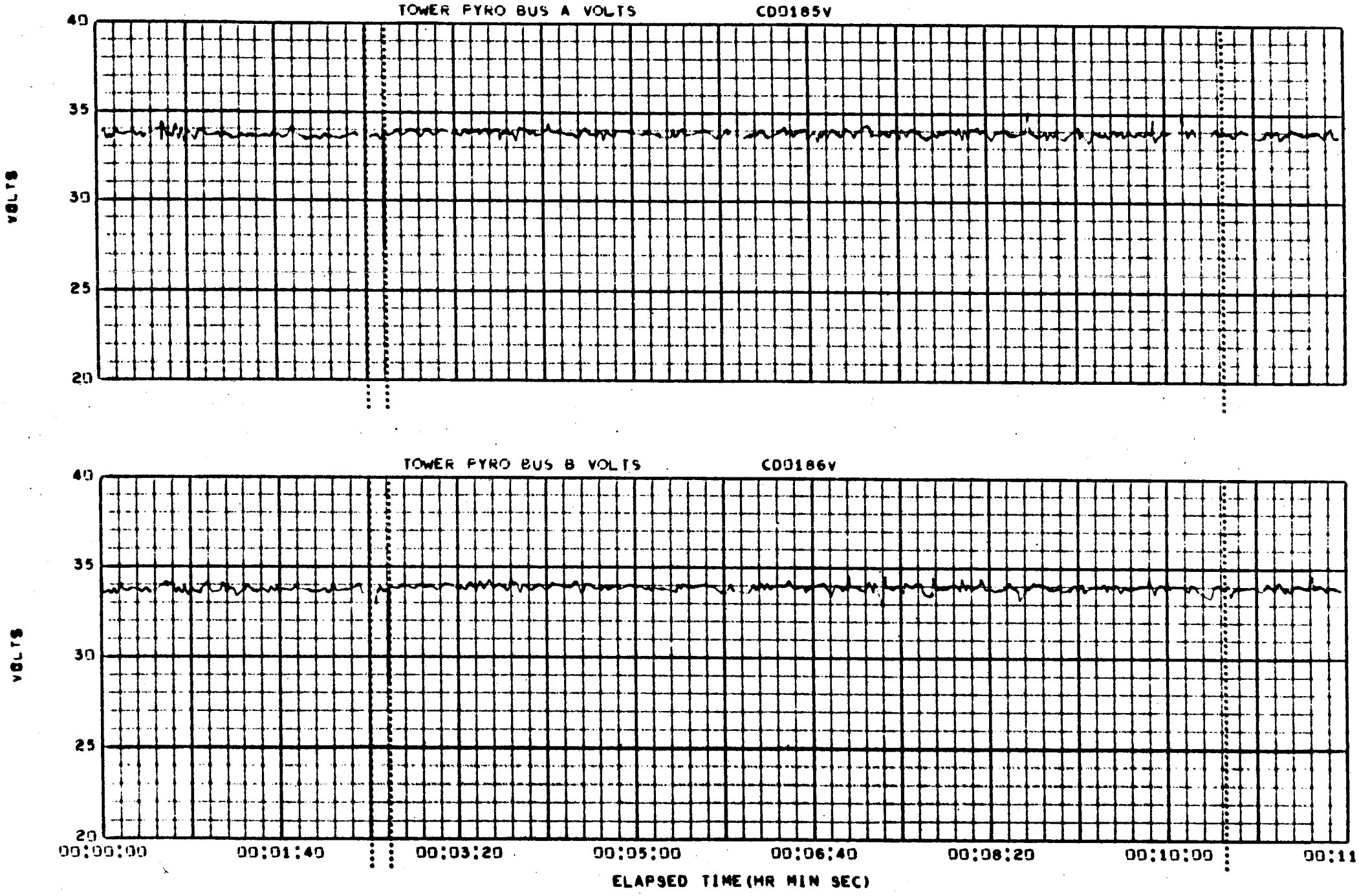
CONFIDENTIAL

TOWER PYRO BUS A VOLTS
CD0185V
40
35
30
25
20
VOLTS
TOWER PYRO BUS B VOLTS
CD0186V
40
35
30
25
20
VOLTS
00:09:00
00:09:40
00:10:20
00:11:00
00:11:40
00:12:20
00:13:00
00:13:40
ELAPSED TIME (HR MIN SEC)

00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:10:32.00 ORBIT INSERTION

APOLLO BP-13

~~CONFIDENTIAL~~

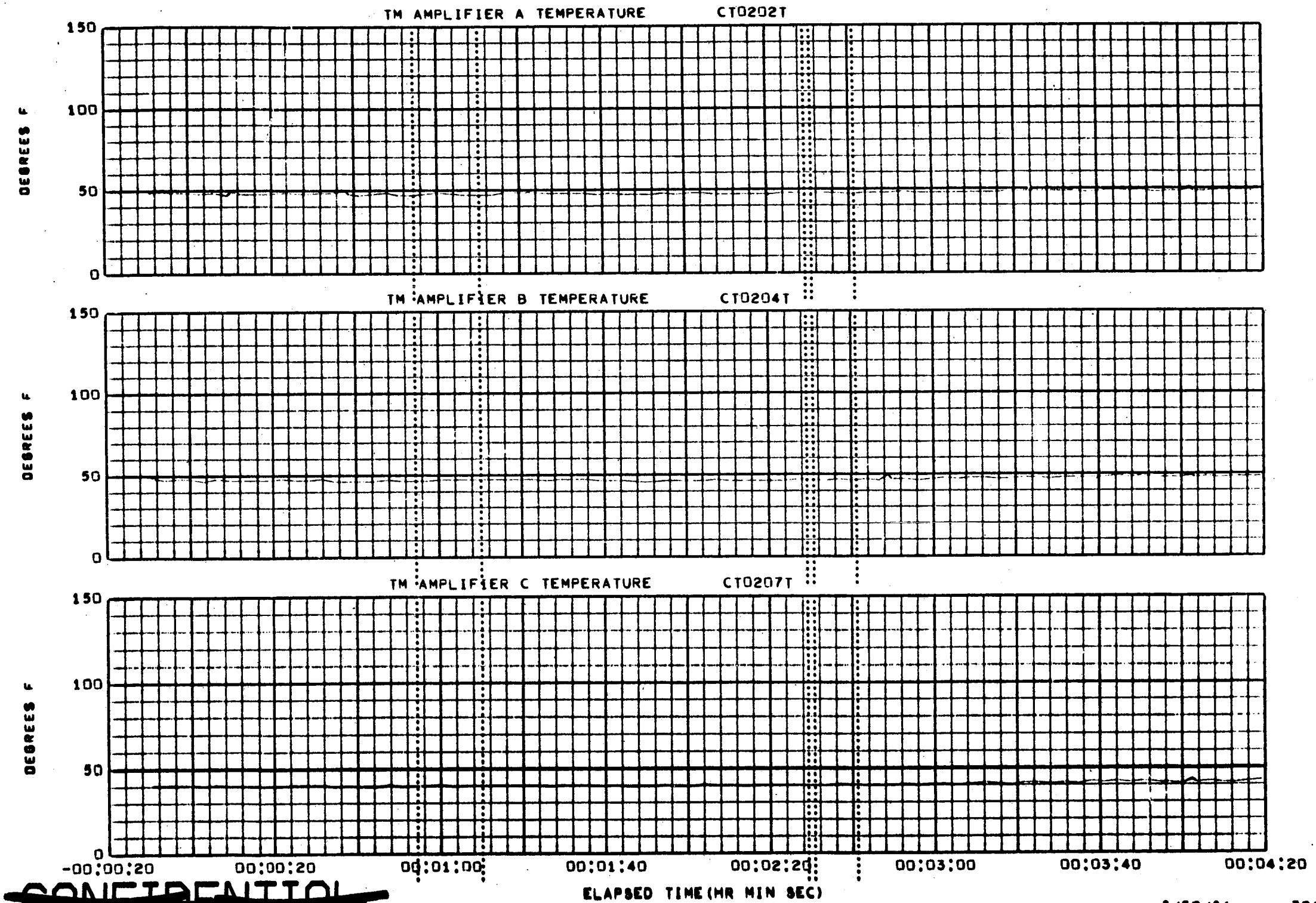


~~CONFIDENTIAL~~

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

APOLLO BP-13

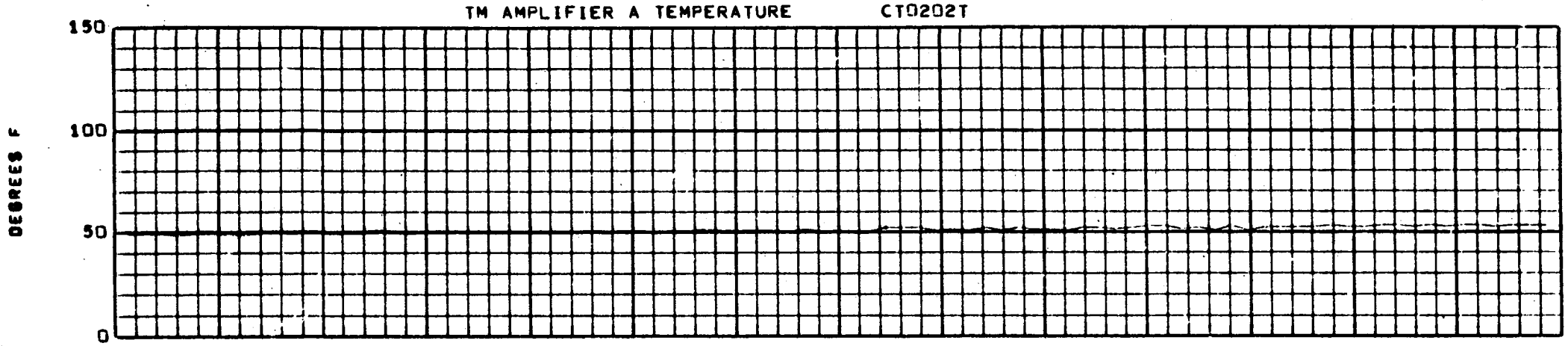
~~CONFIDENTIAL~~



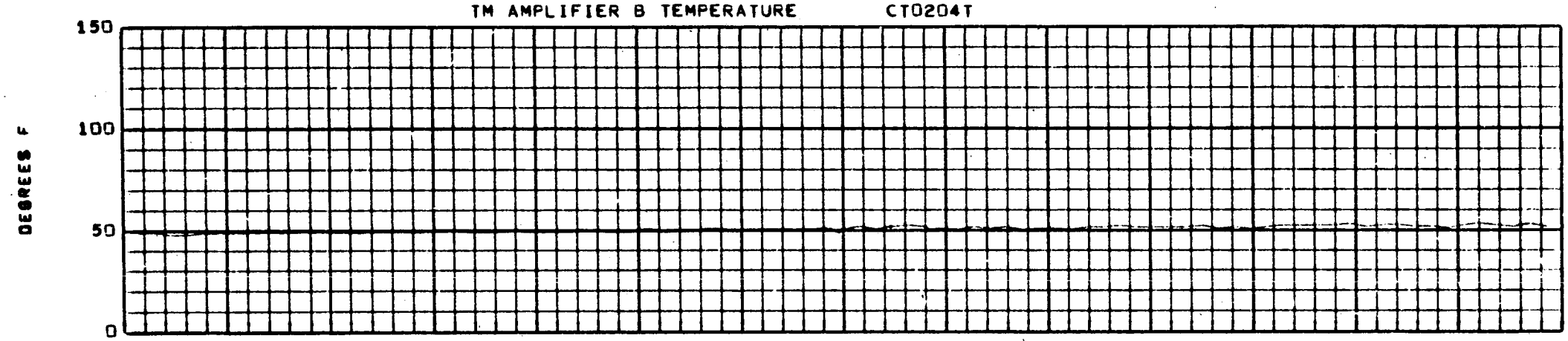
~~CONFIDENTIAL~~

CONFIDENTIAL

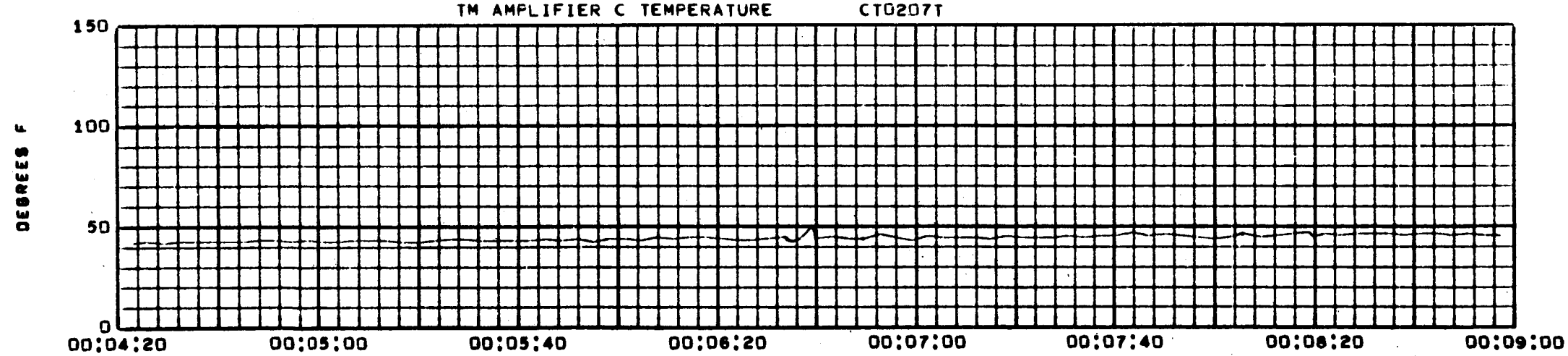
TM AMPLIFIER A TEMPERATURE CT0202T



TM AMPLIFIER B TEMPERATURE CT0204T



TM AMPLIFIER C TEMPERATURE CT0207T



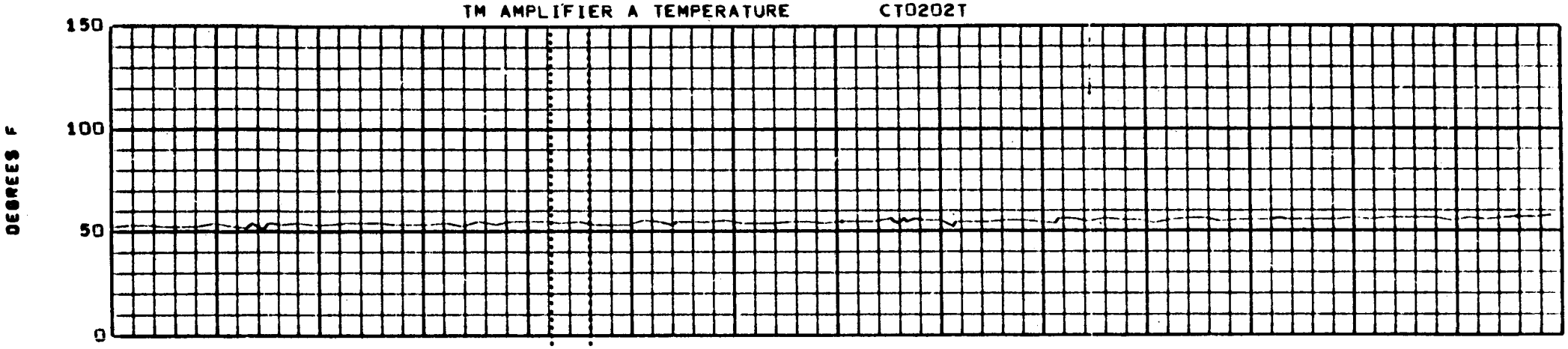
CONFIDENTIAL

00:10:32.00 ORBIT INSERTION
00:10:24.60 S-IV BURNOUT

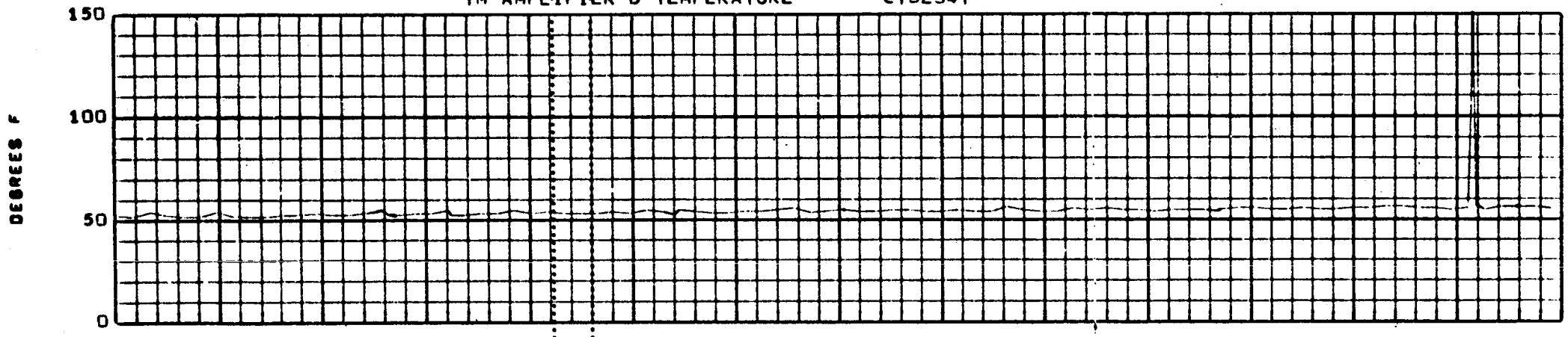
APOLLO BP-13

CONFIDENTIAL

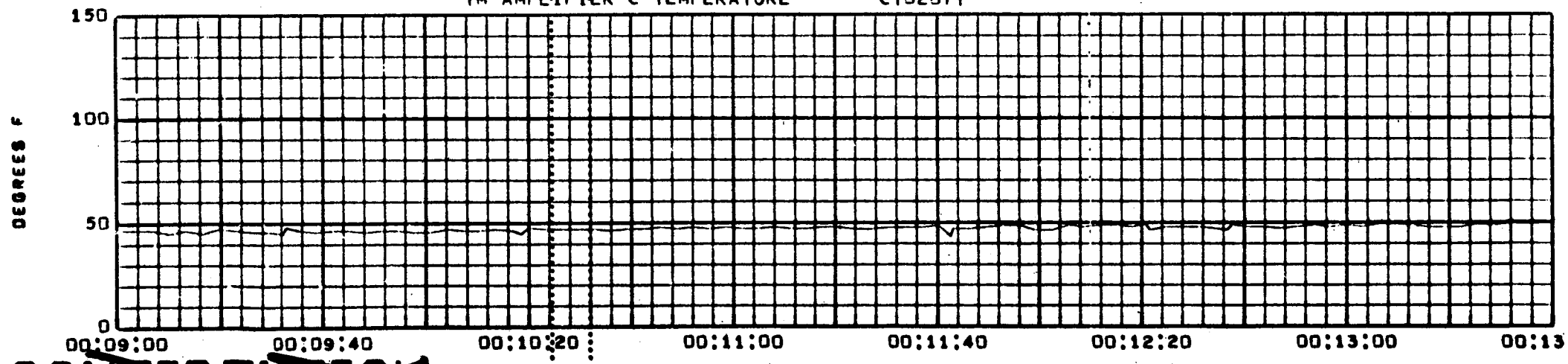
TM AMPLIFIER A TEMPERATURE CT0202T



TM AMPLIFIER B TEMPERATURE CT0204T



TM AMPLIFIER C TEMPERATURE CT0207T



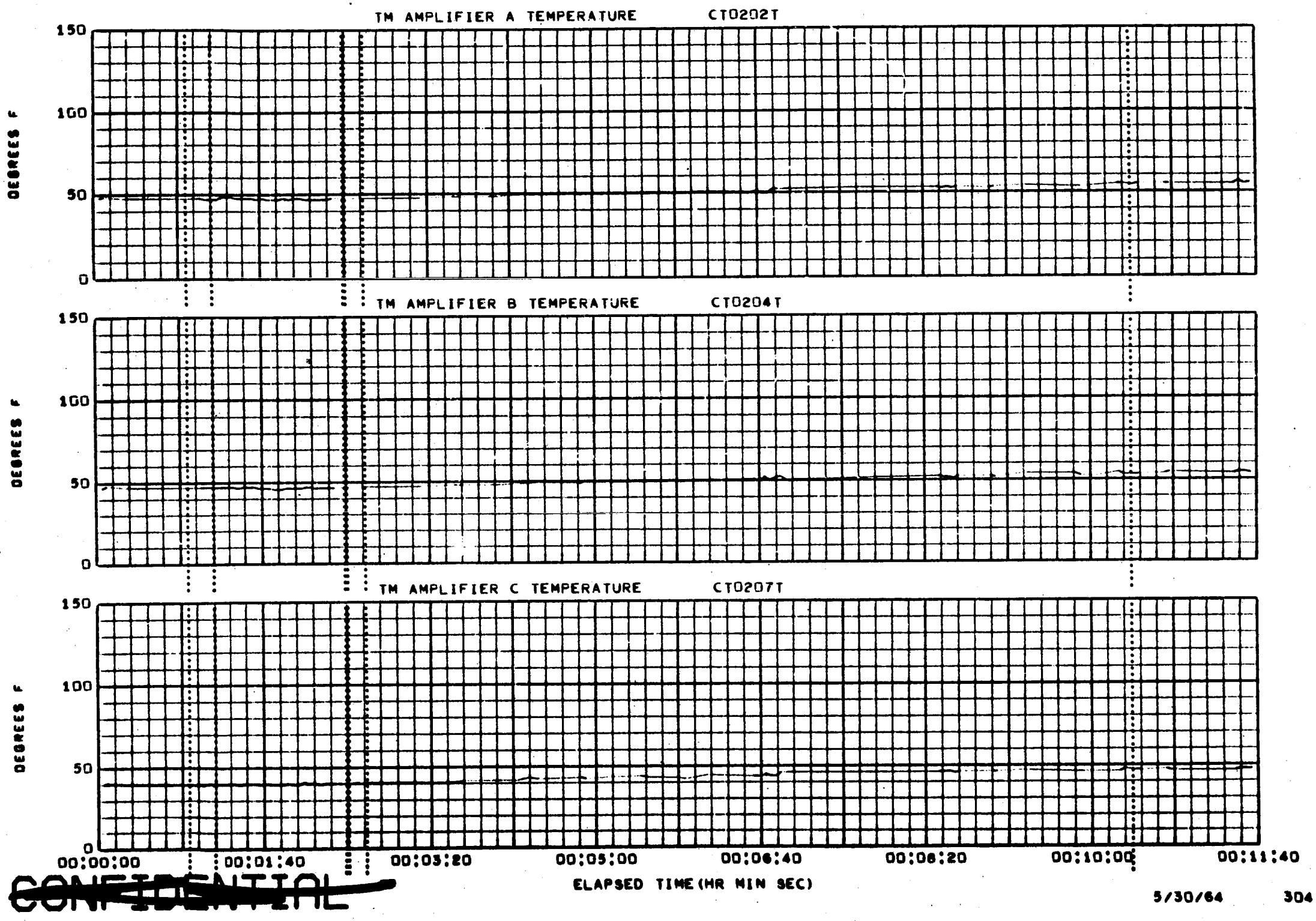
CONFIDENTIAL

5/30/64 303

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

~~CONFIDENTIAL~~

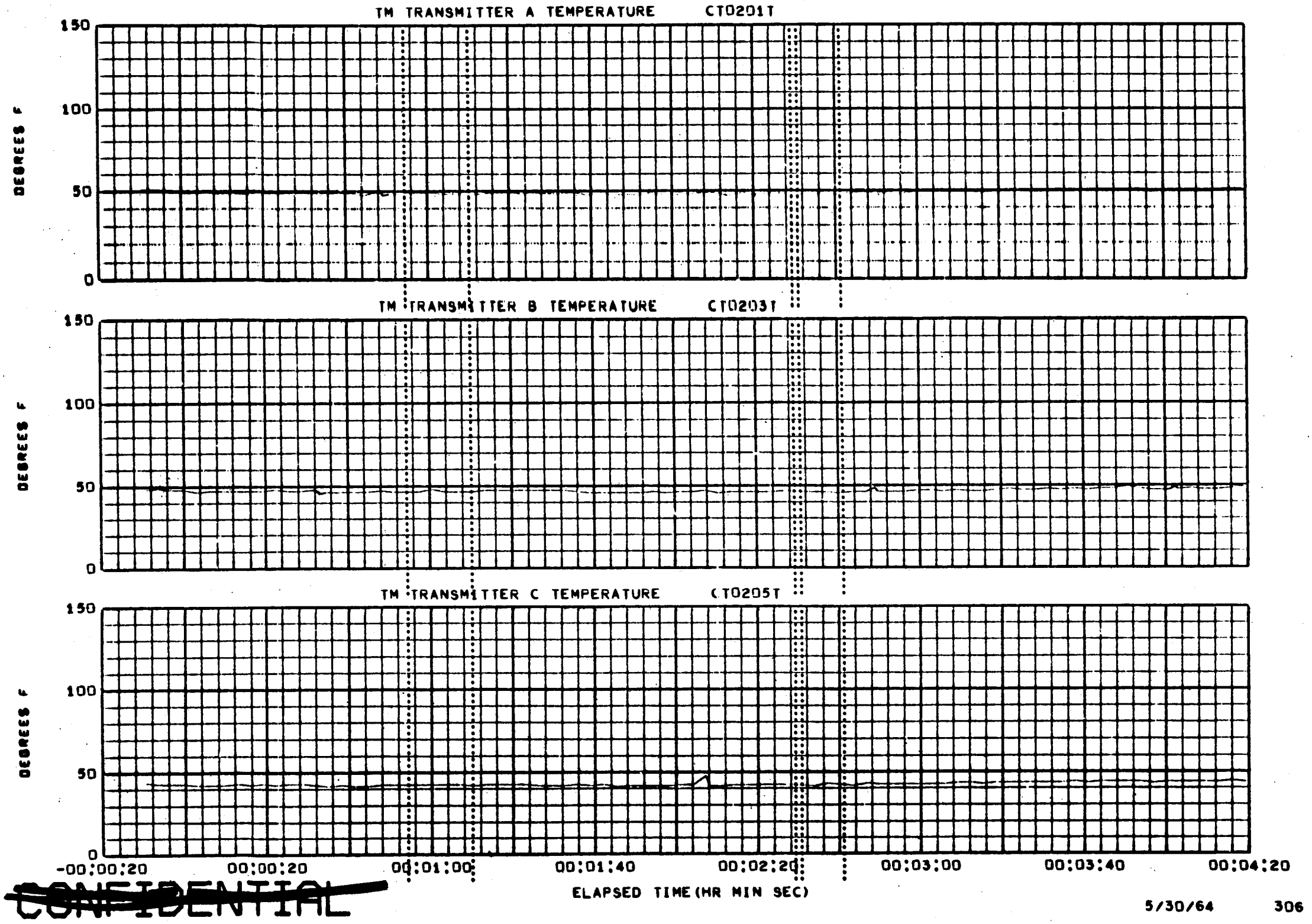


~~CONFIDENTIAL~~

5/30/64 304

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

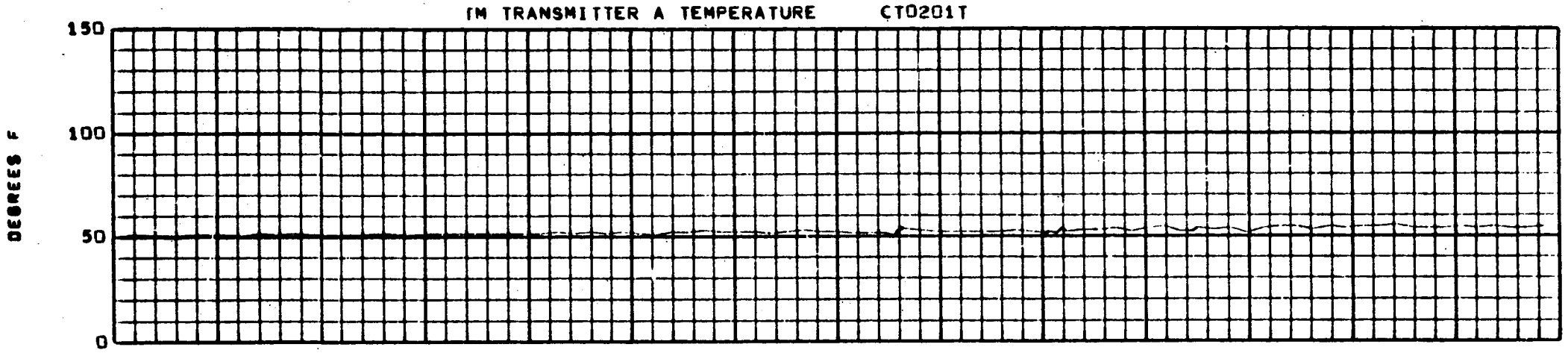
~~CONFIDENTIAL~~



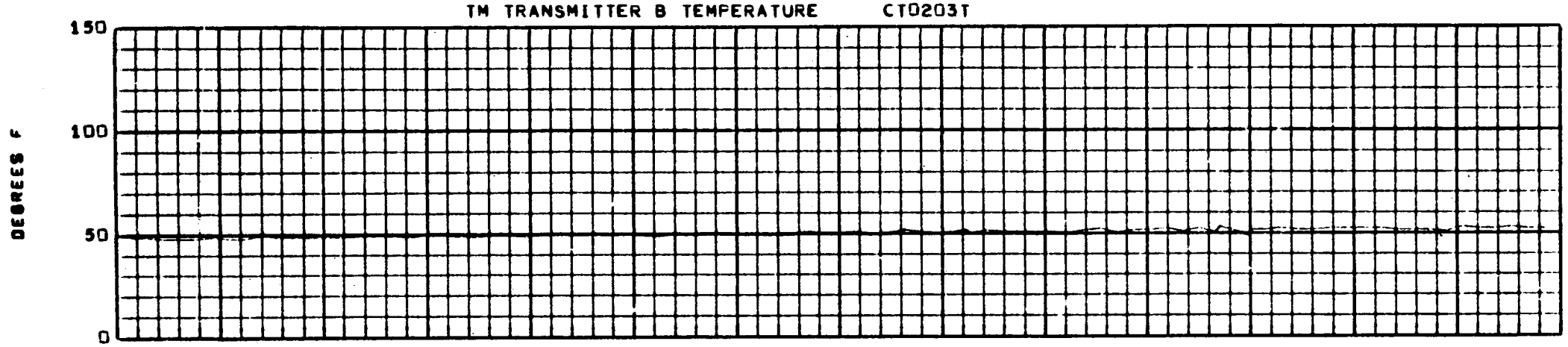
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

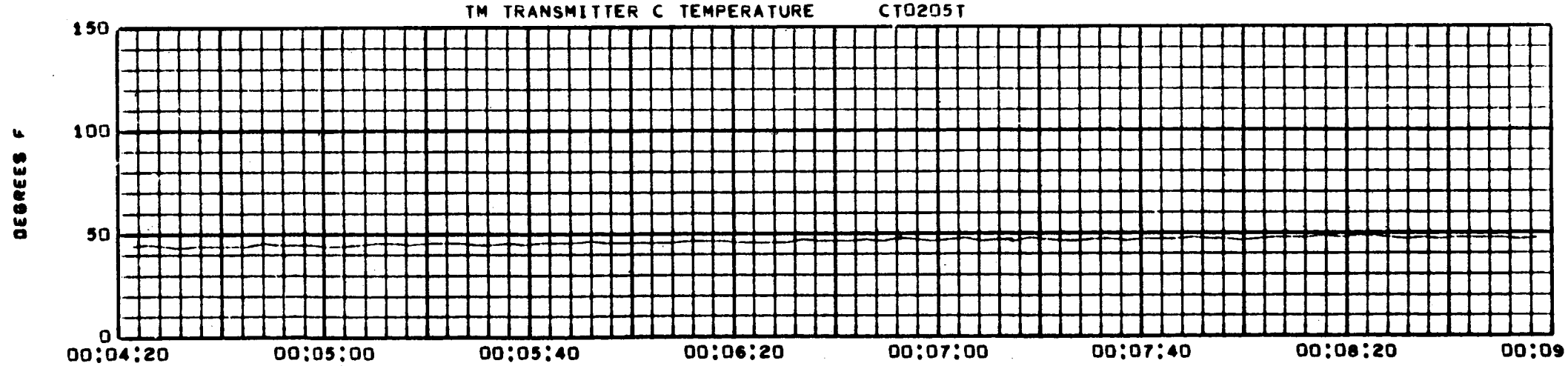
TM TRANSMITTER A TEMPERATURE CT0201T



TM TRANSMITTER B TEMPERATURE CT0203T



TM TRANSMITTER C TEMPERATURE CT0205T



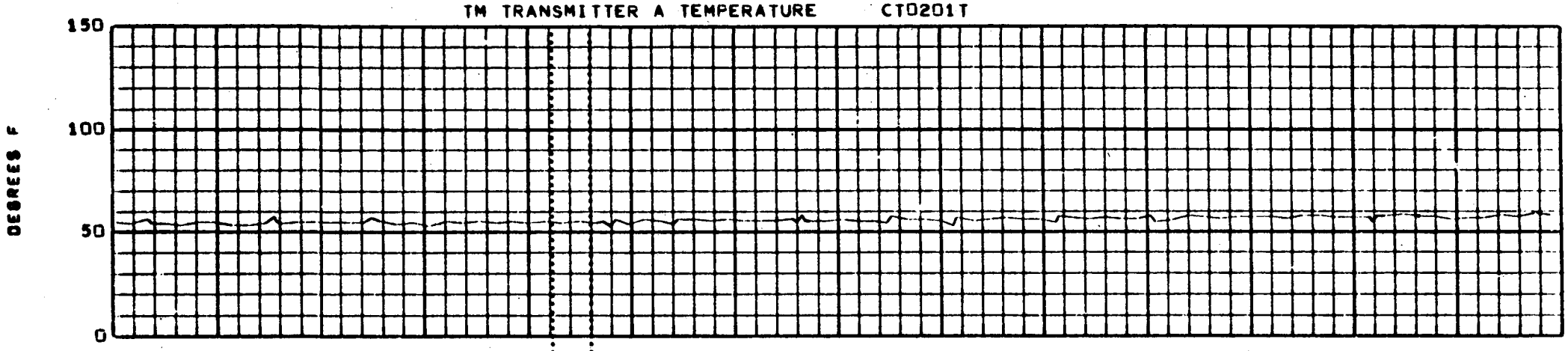
~~CONFIDENTIAL~~

00:10:32.00 ORBIT INSERTION
00:10:24.60 S-IV BURNOUT

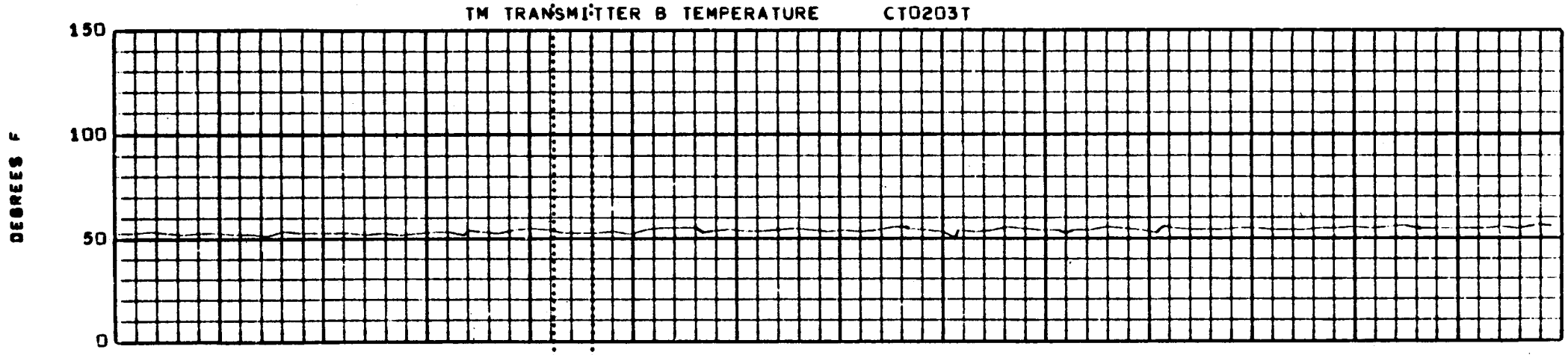
APOLLO BP-13

CONFIDENTIAL

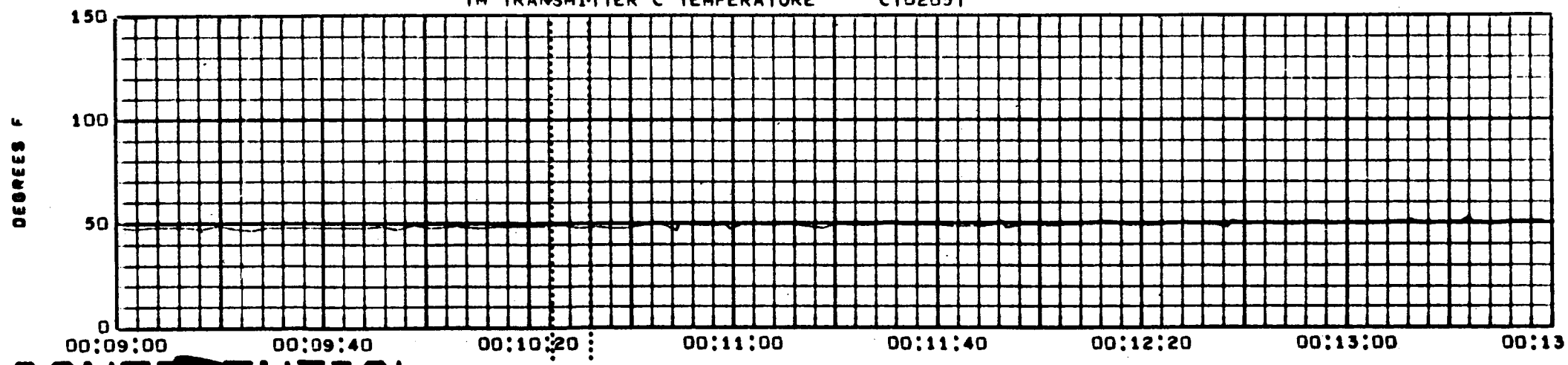
TM TRANSMITTER A TEMPERATURE CT0201T



TM TRANSMITTER B TEMPERATURE CT0203T



TM TRANSMITTER C TEMPERATURE CT0205T



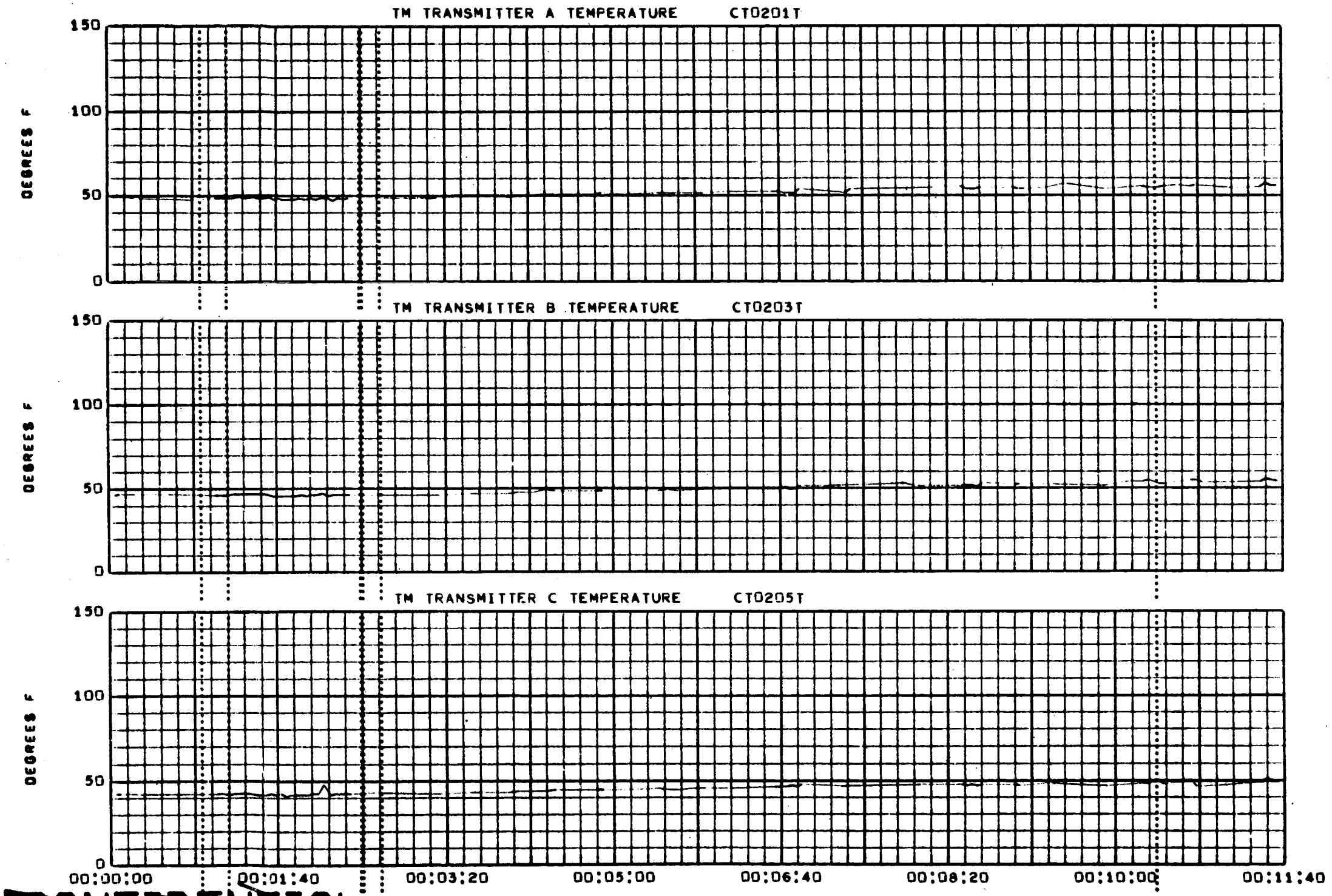
CONFIDENTIAL

5/30/64 308

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

~~CONFIDENTIAL~~



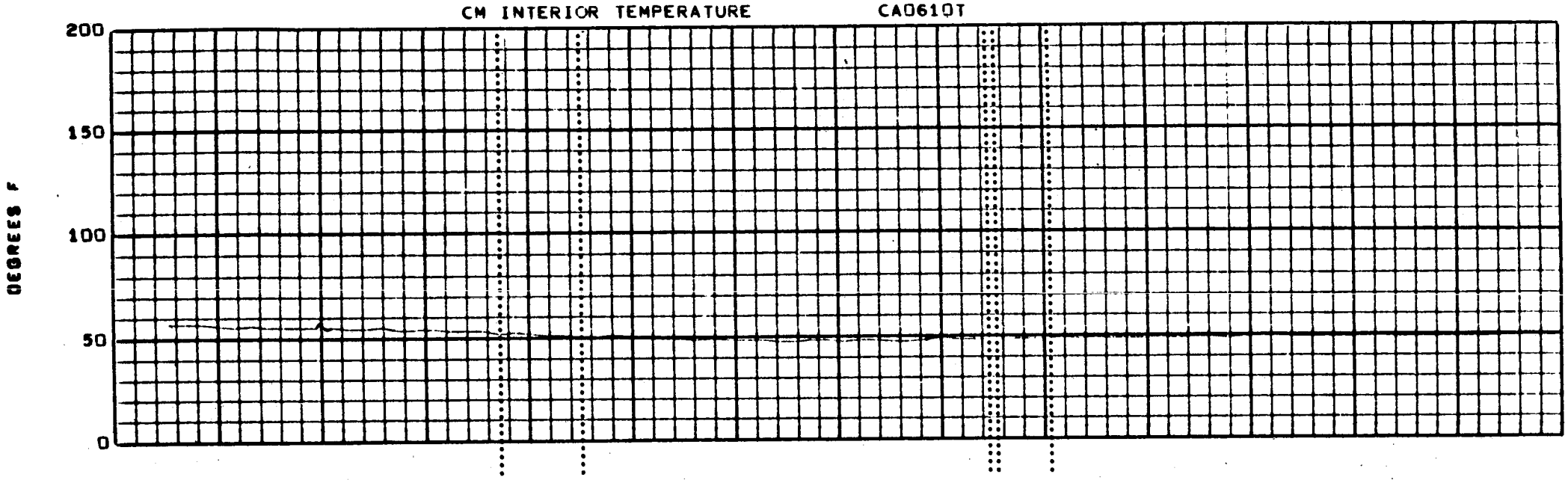
~~CONFIDENTIAL~~

5/30/64 309

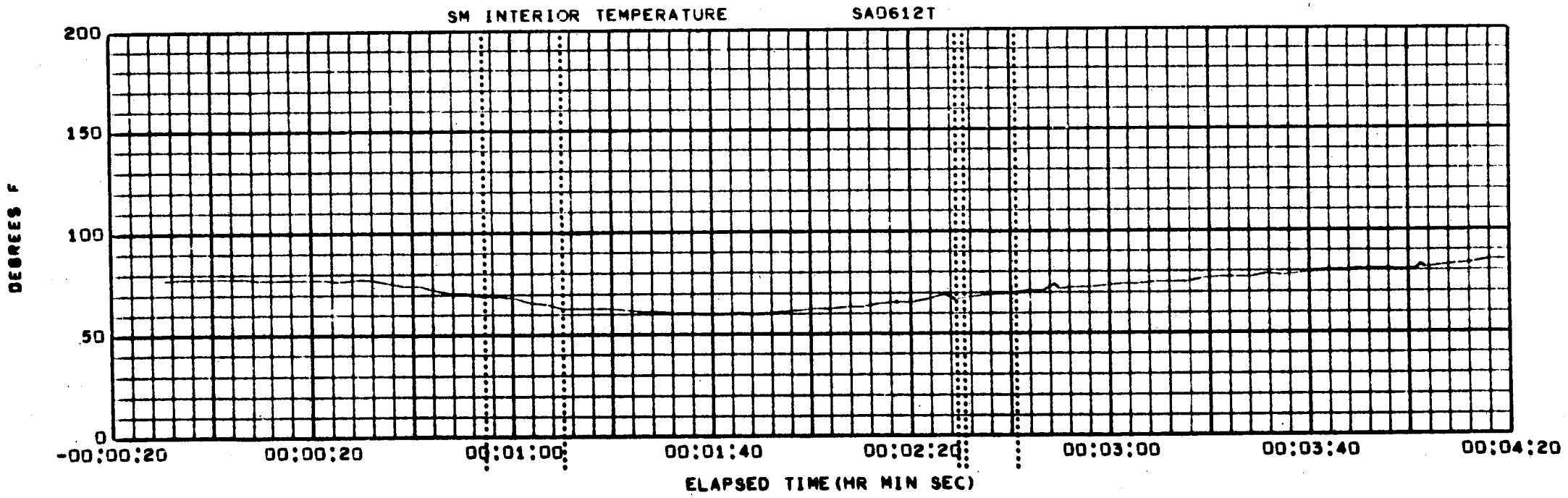
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON

CONFIDENTIAL

CM INTERIOR TEMPERATURE CA0610T



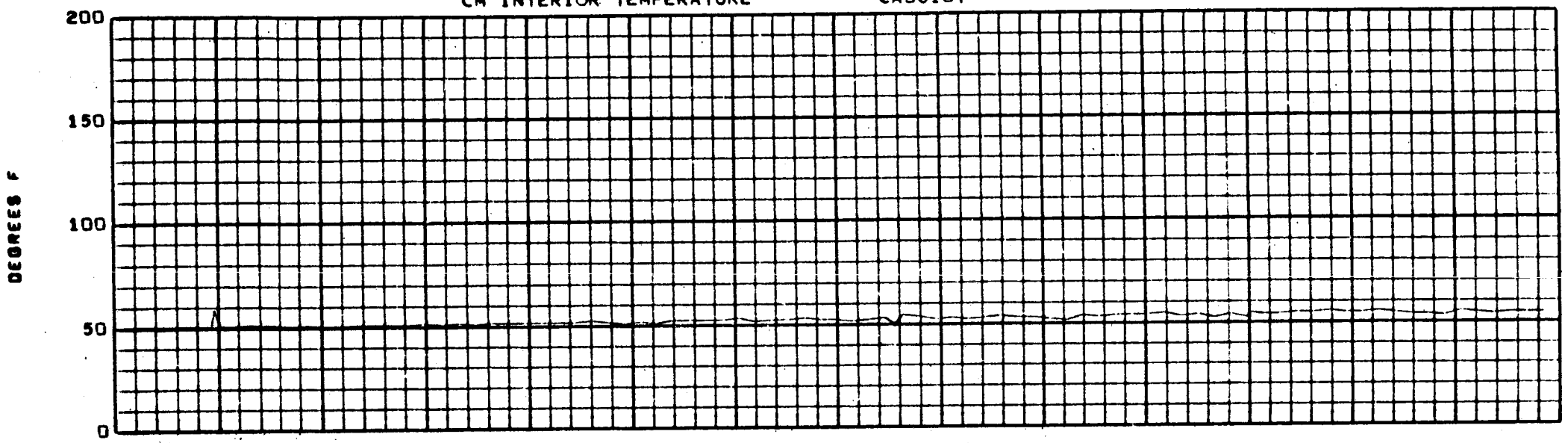
SM INTERIOR TEMPERATURE SA0612T



CONFIDENTIAL

CONFIDENTIAL

CM INTERIOR TEMPERATURE CA0610T



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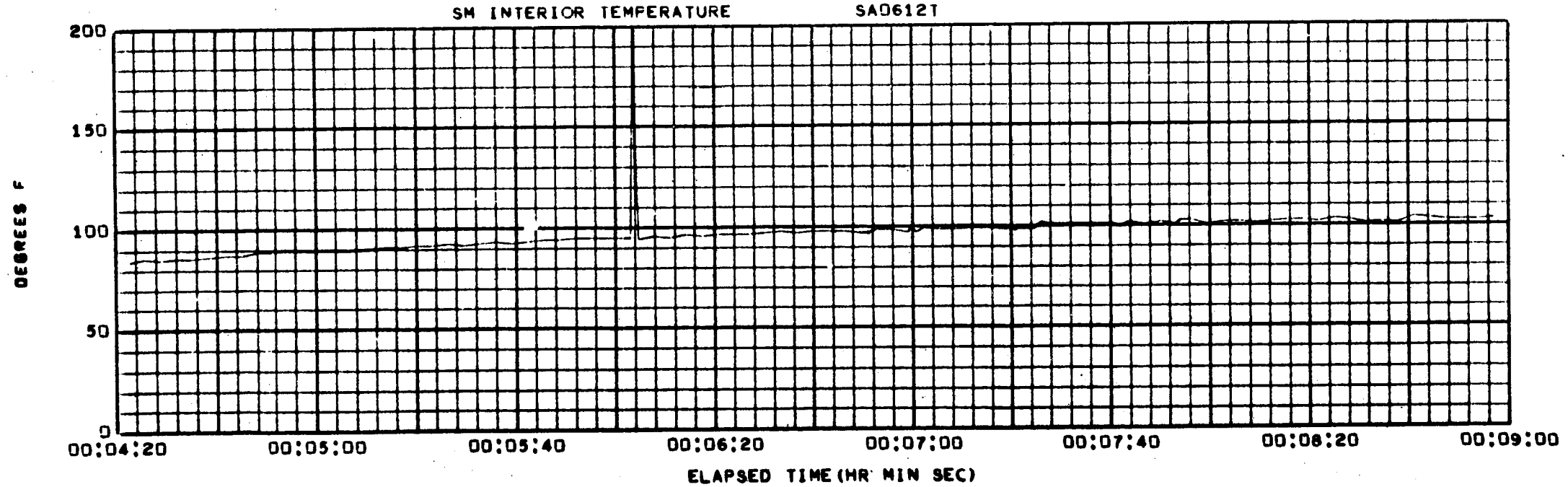

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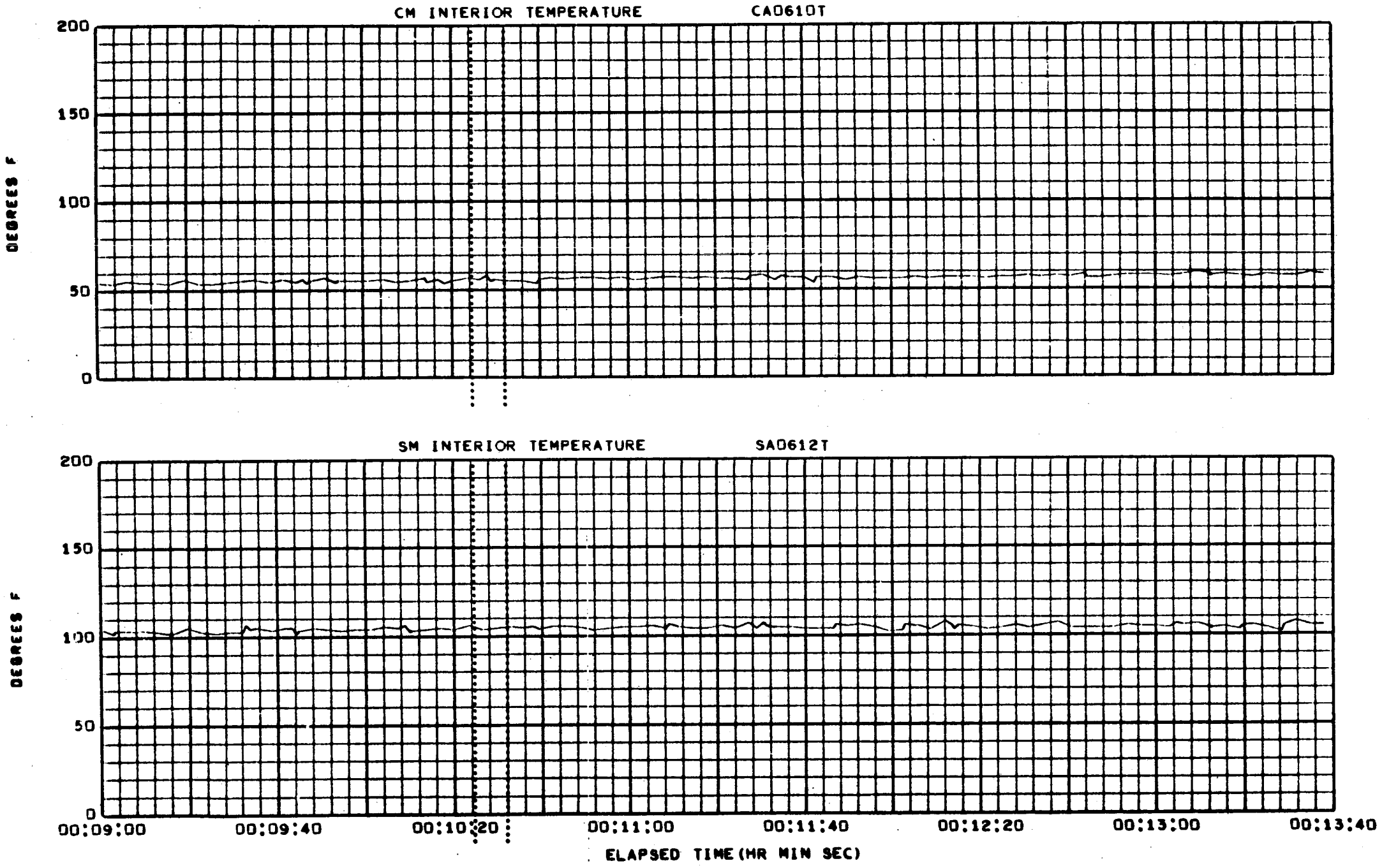
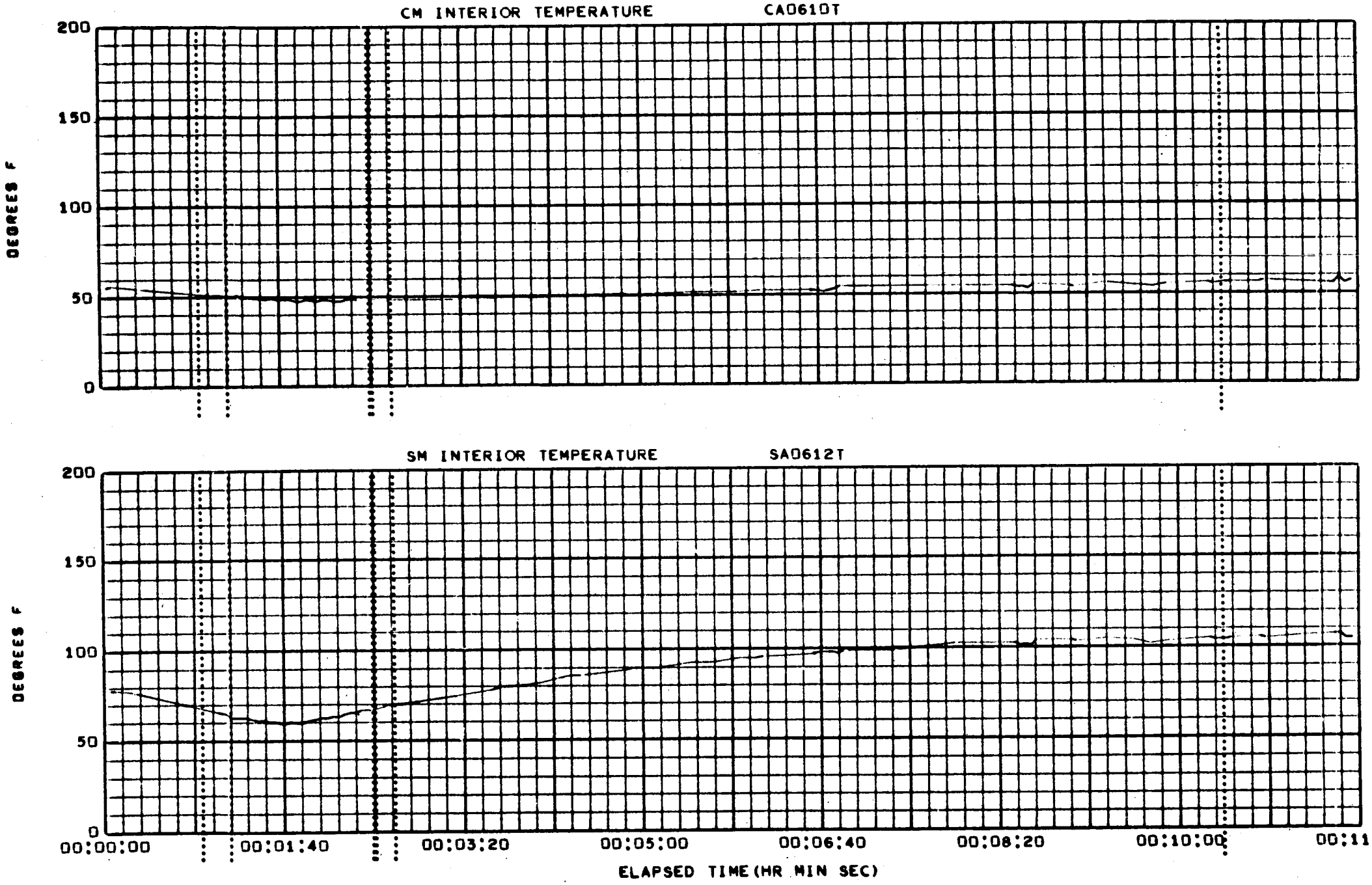

CM INTERIOR TEMPERATURE
CA0610T
SM INTERIOR TEMPERATURE
SA0612T
DEGREES F
200
150
100
50
0
00:09:00
00:09:40
00:10:20
00:11:00
00:11:40
00:12:20
00:13:00
00:13:40
ELAPSED TIME (HR MIN SEC)

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:10:24.60 S-IV BURNOUT

CONFIDENTIAL

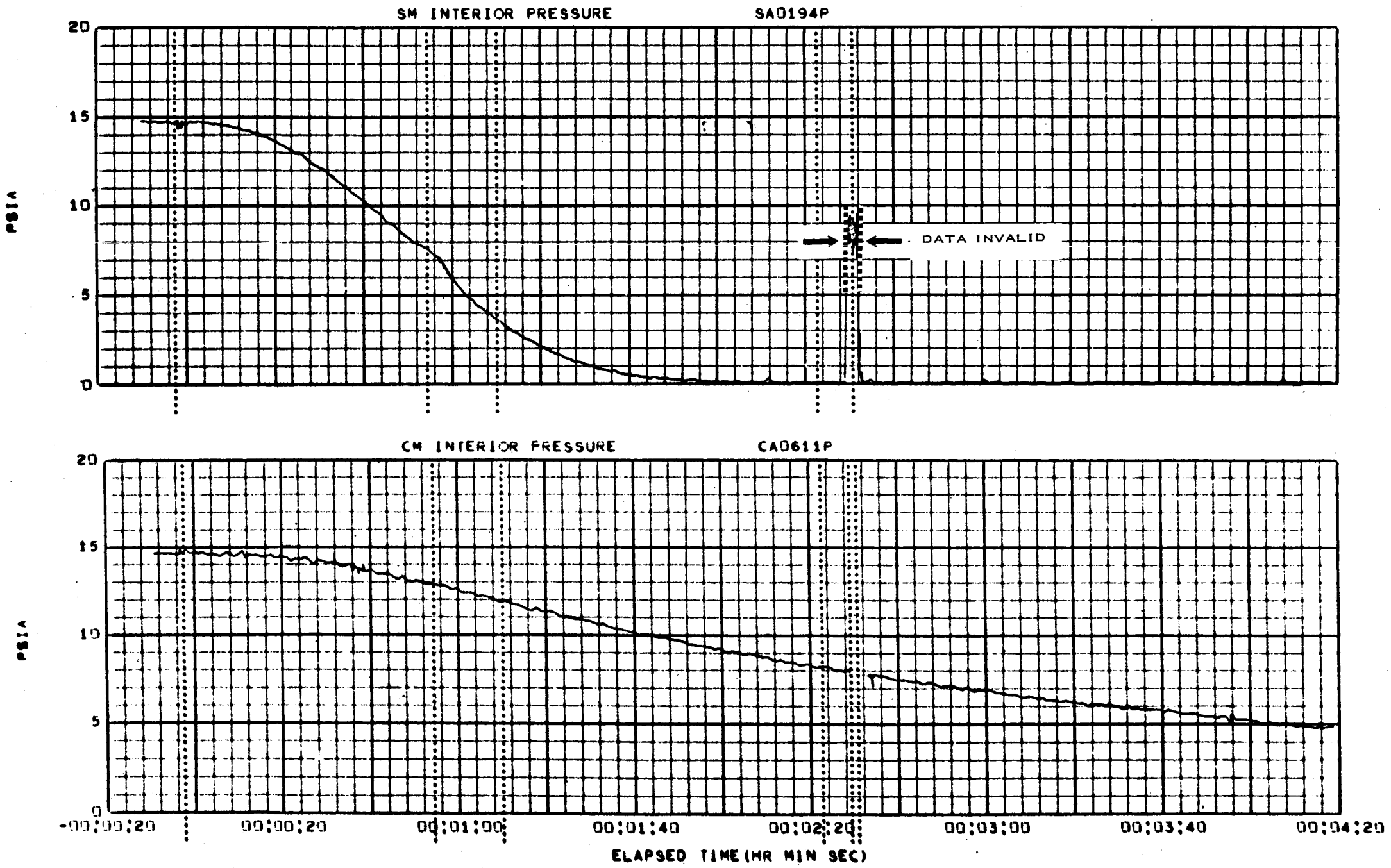


CONFIDENTIAL

-00:00:02.55 S-I IGNITION
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.68 S-I INBD.ENG. CUT-OFF
00:02:30.90 S-IV IGNITION

APOLLO BP-13

~~CONFIDENTIAL~~



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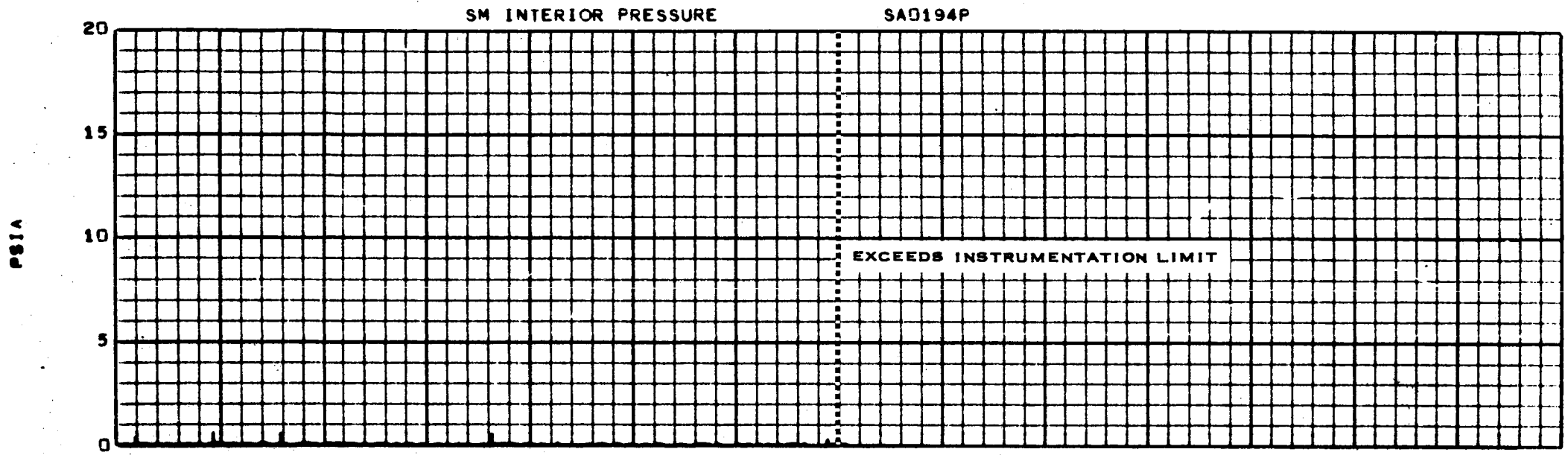

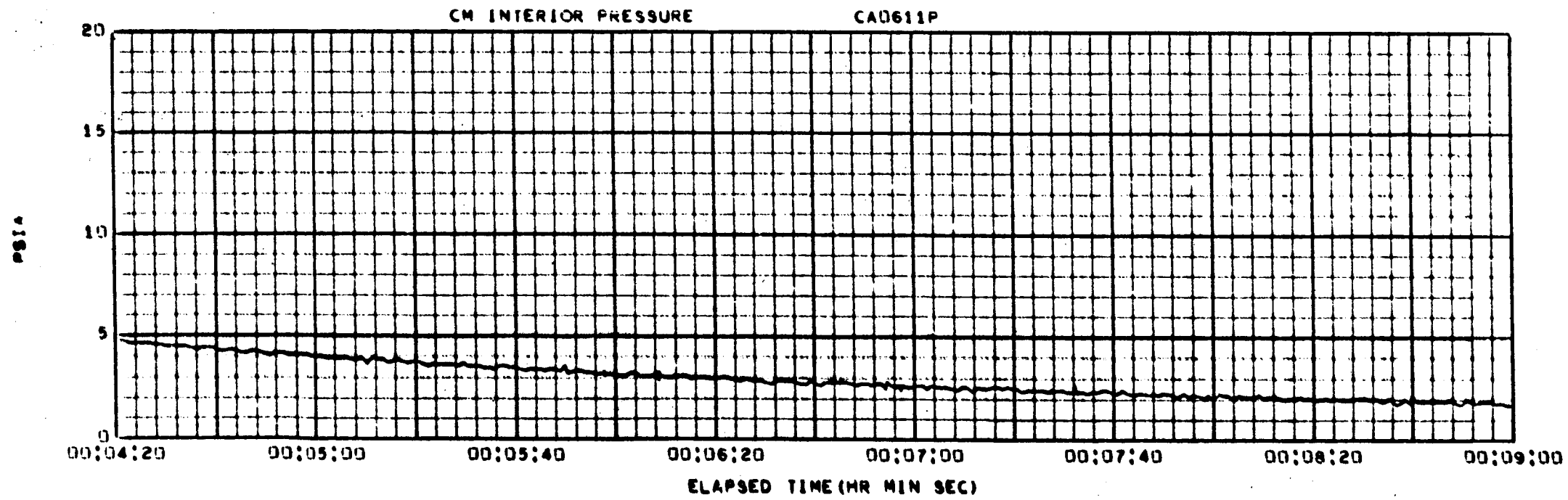

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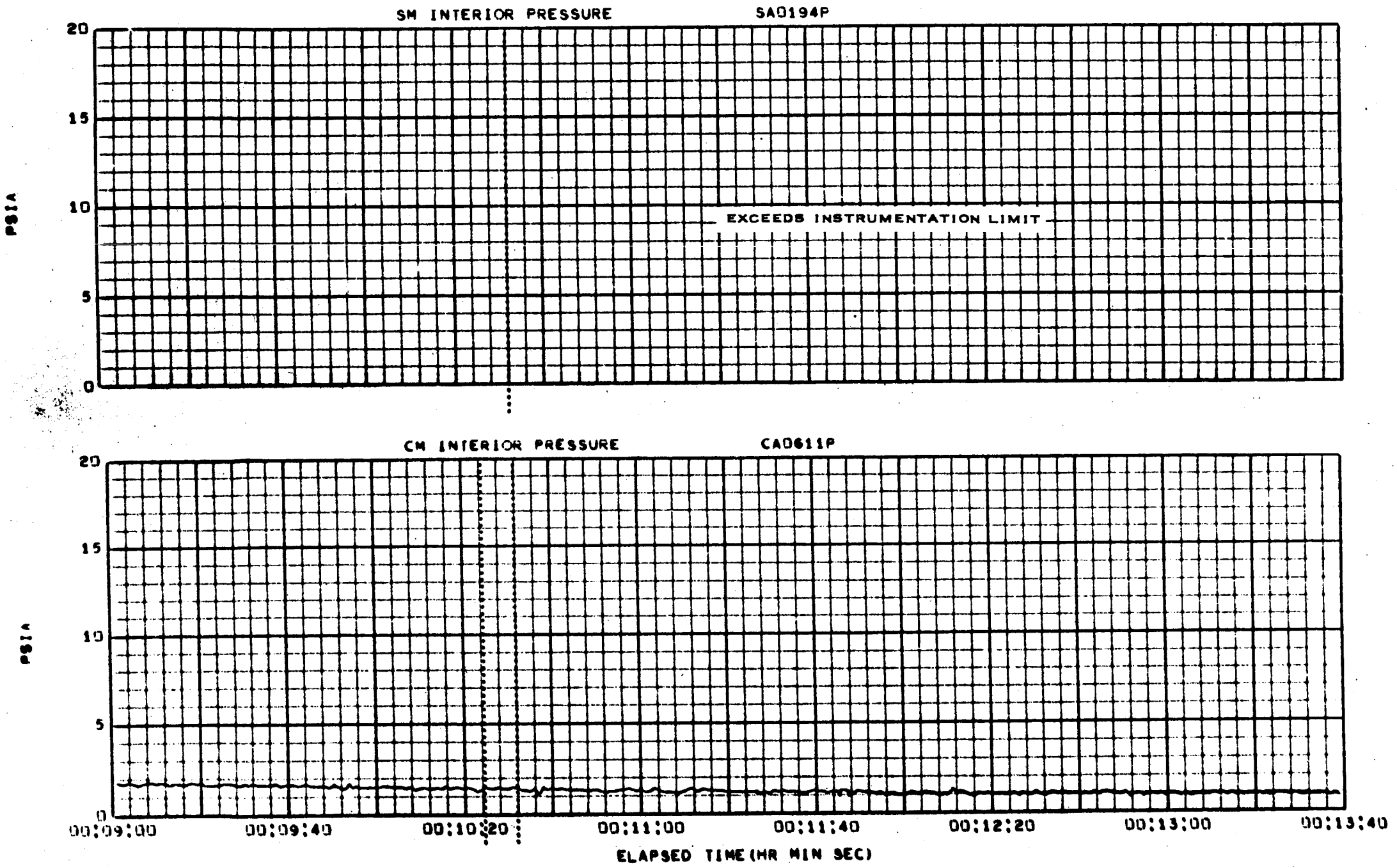
SM INTERIOR PRESSURE
SA0194P
20
15
10
5
0
PSIA
EXCEEDS INSTRUMENTATION LIMIT
CM INTERIOR PRESSURE
CA0611P
20
15
10
5
0
PSIA
00:09:00
00:09:40
00:10:20
00:11:00
00:11:40
00:12:20
00:13:00
00:13:40
ELAPSED TIME (HR MIN SEC)

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.88 S-I INBD.ENG. CUT-OFF
00:02:30.90 S-IV IGNITION
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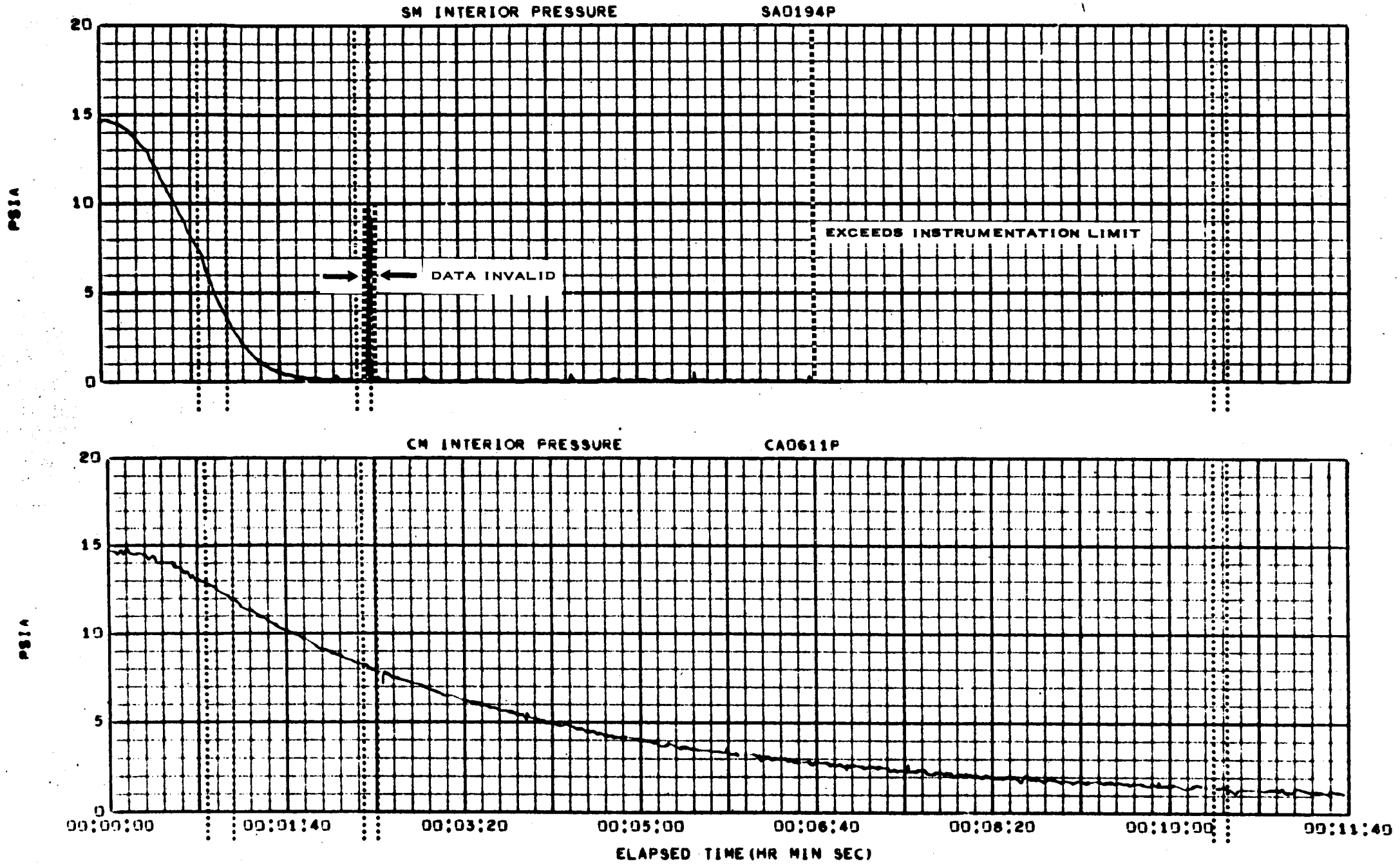
00:10:32.00 ORBIT INSERTION

CONFIDENTIAL



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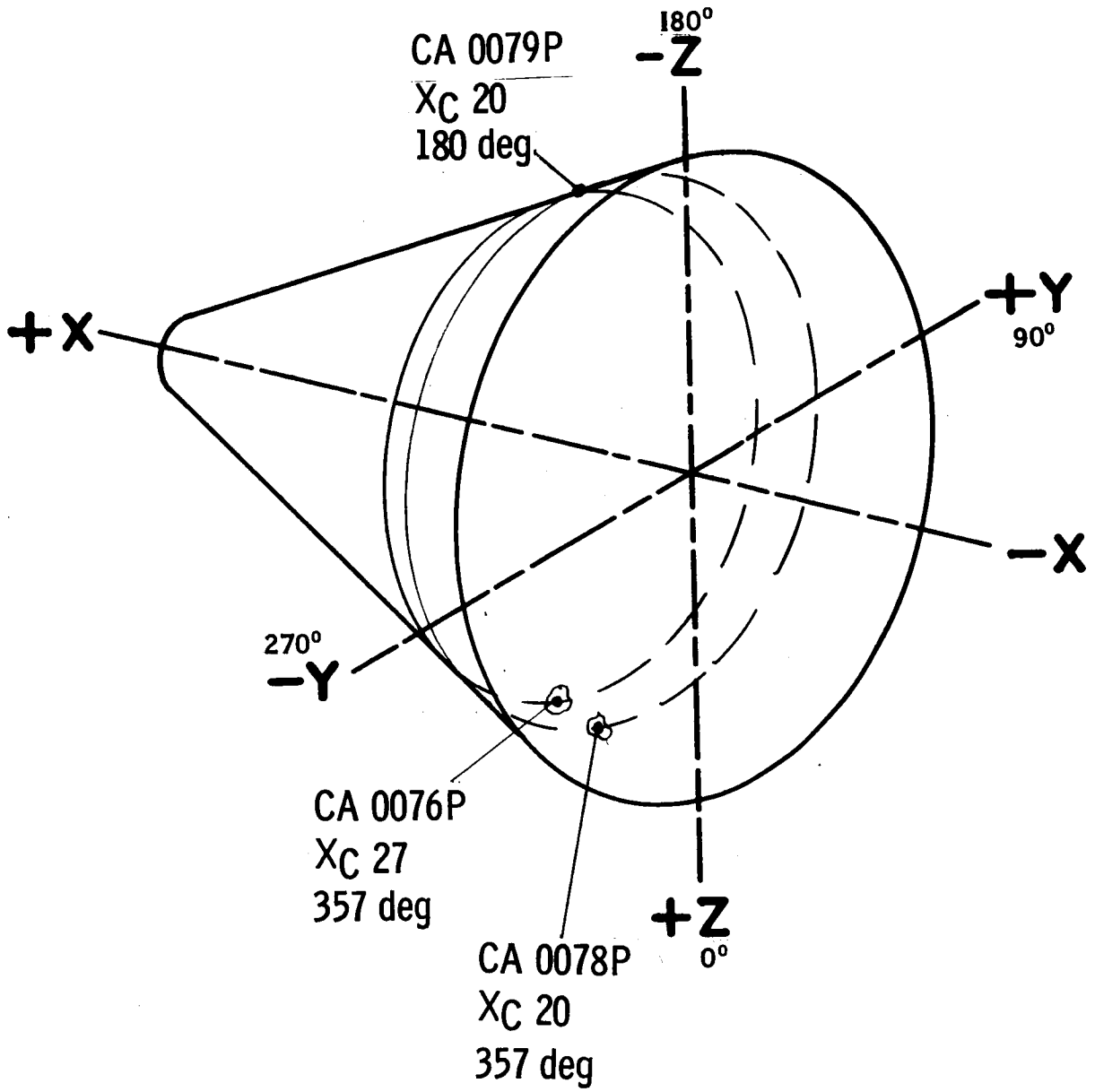
CA 0079P
X_C 20
180 deg
180°
-Z
+X
+Y
90°
-X
270°
-Y
CA 0076P
X_C 27
357 deg
CA 0078P
X_C 20
357 deg
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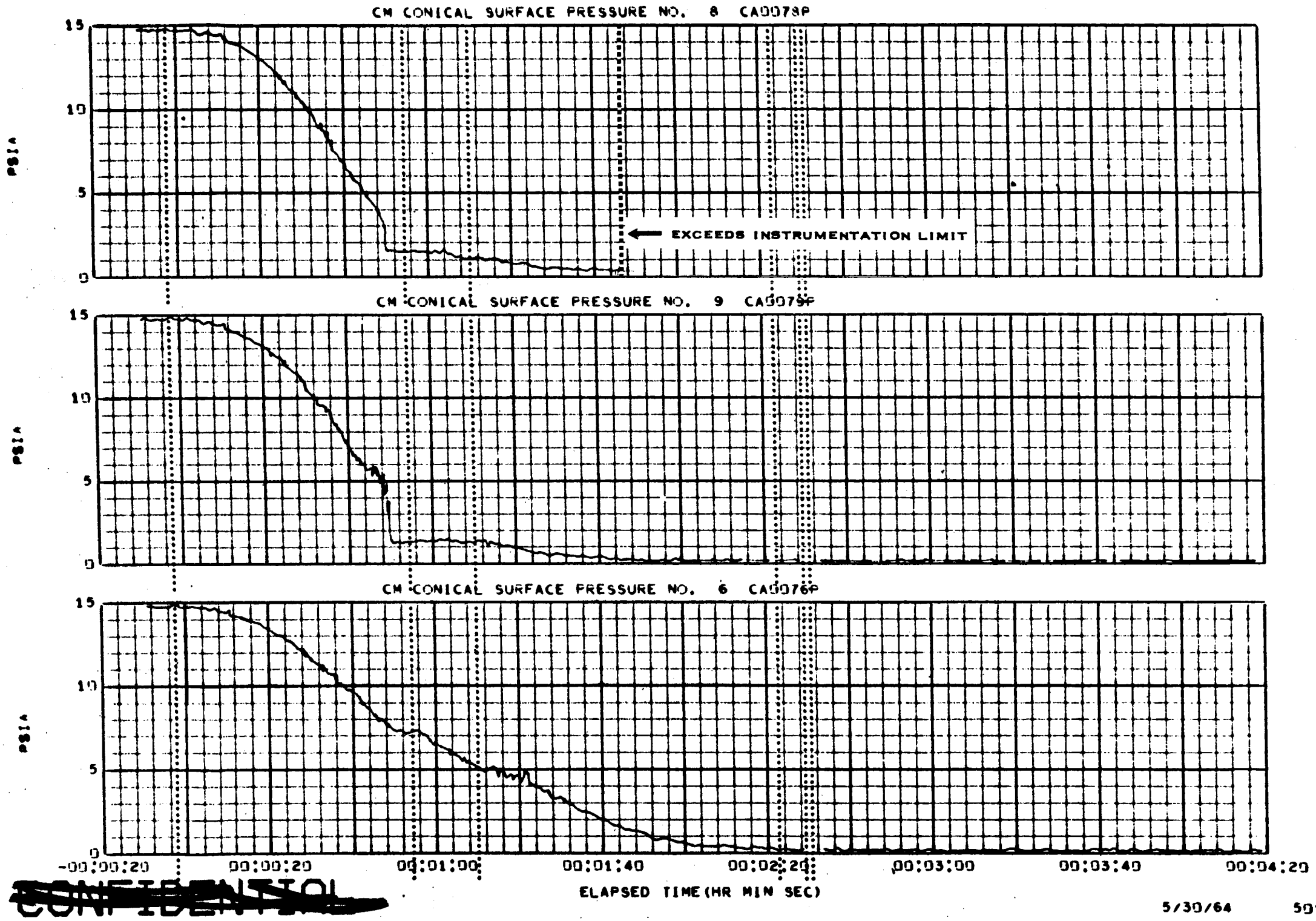
0°

-00:00:02.55 S-I IGNITION
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.88 S-I INBD.ENG. CUT-OFF
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION

APOLLO BP-13

~~CONFIDENTIAL~~



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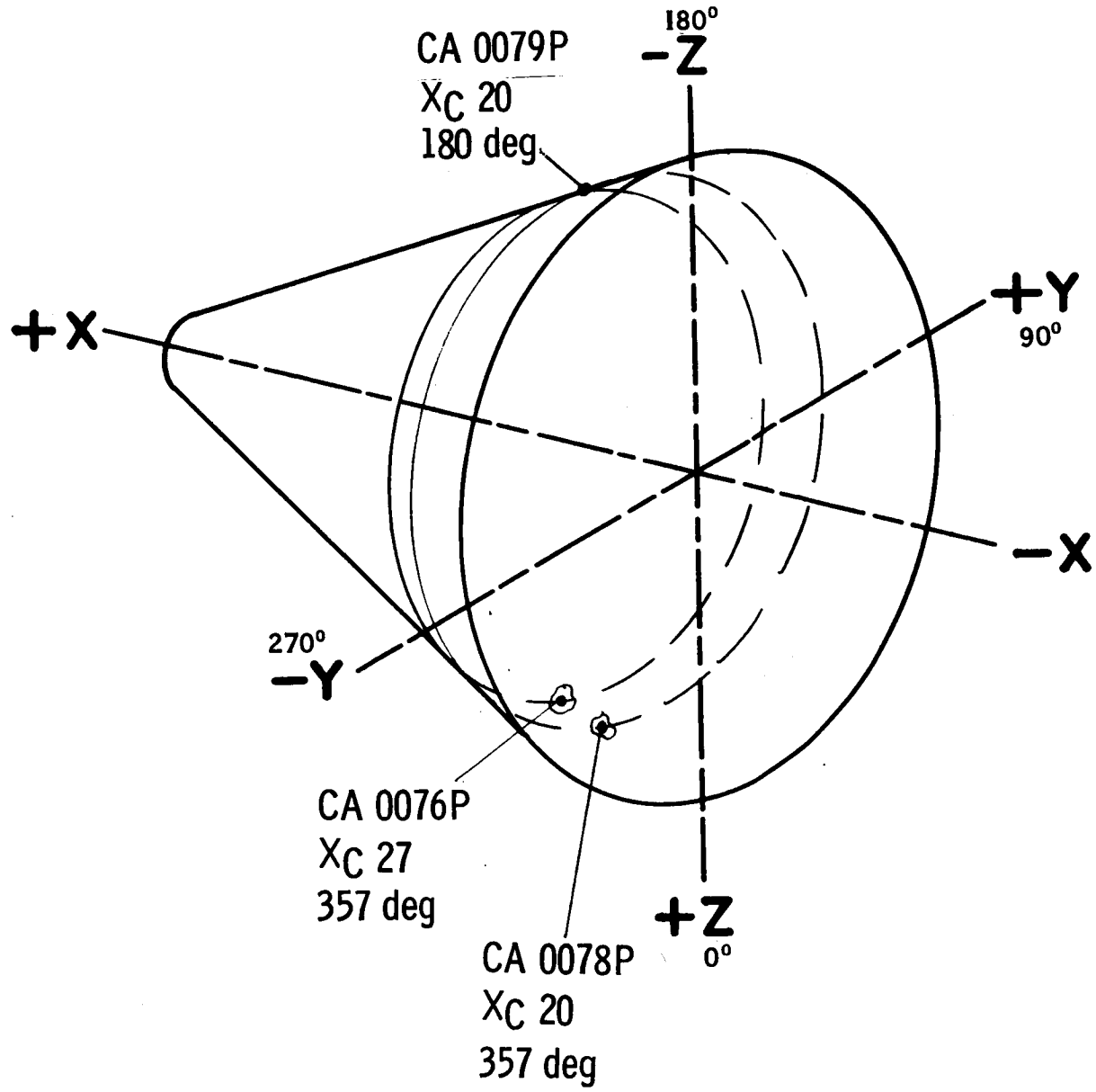
5/30/64 501


CA 0079P
X_C 20
180 deg
180°
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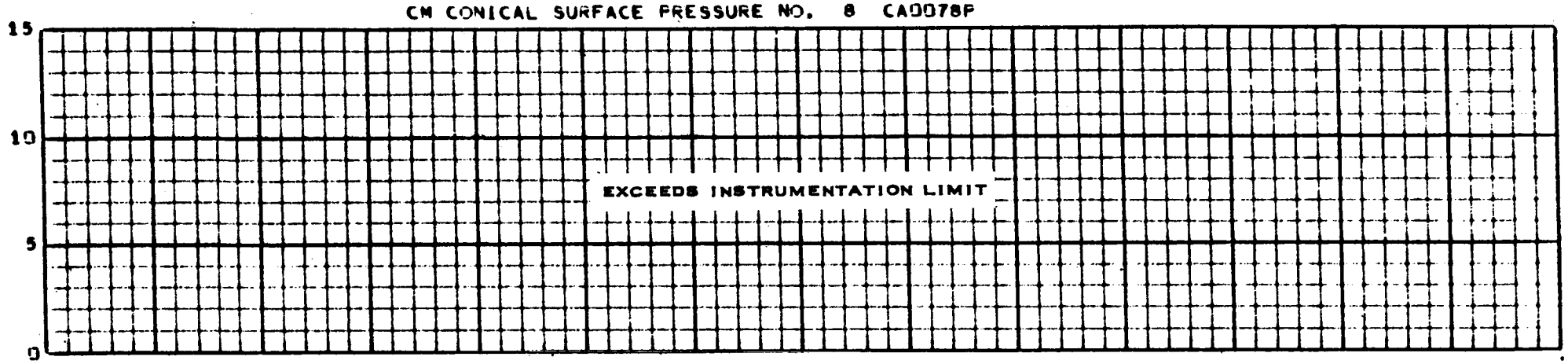
90°
-X
270°
-Y
CA 0076P
X_C 27
357 deg
CA 0078P
X_C 20
357 deg
+Z
0°

CONFIDENTIAL

CM CONICAL SURFACE PRESSURE NO. 8 CA0078P



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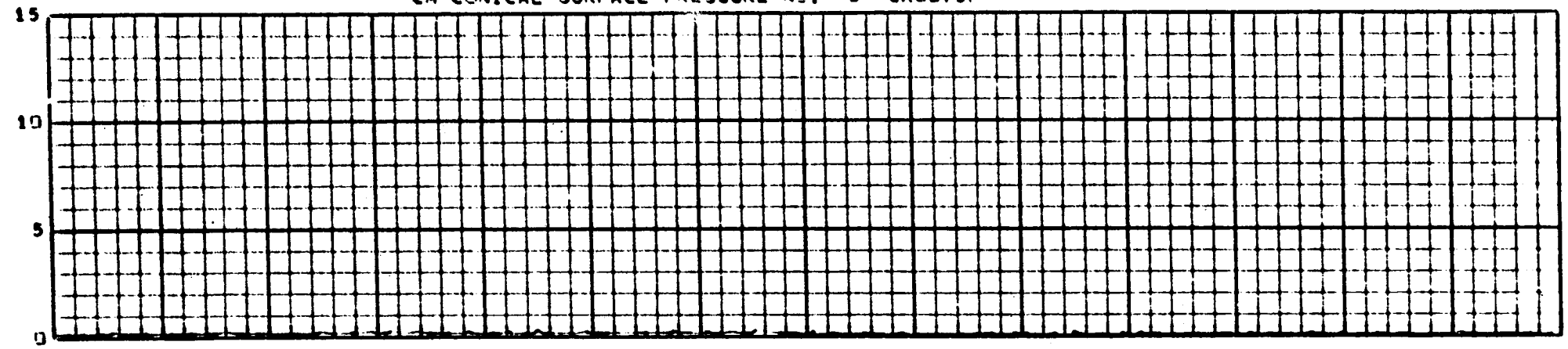

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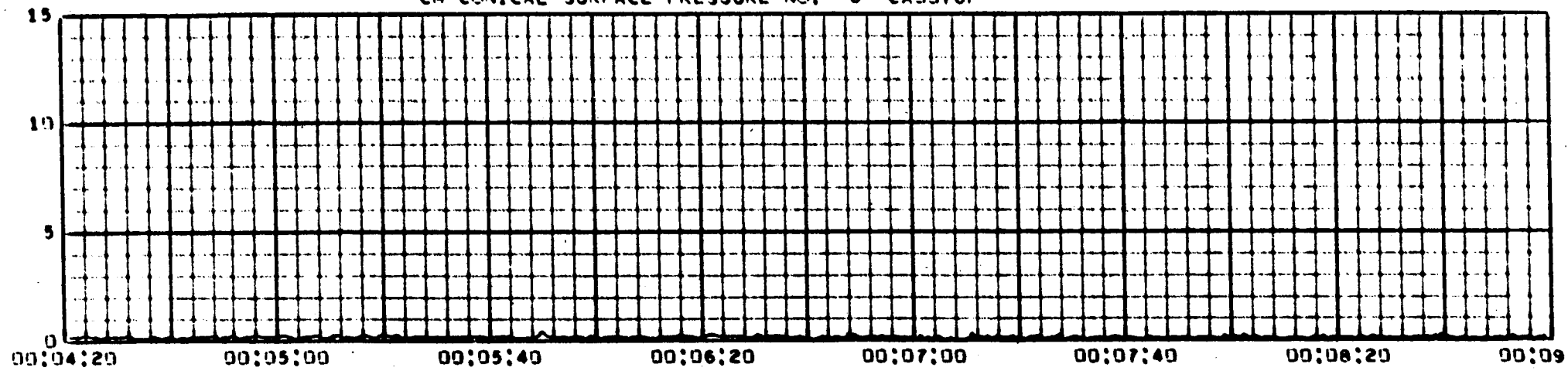

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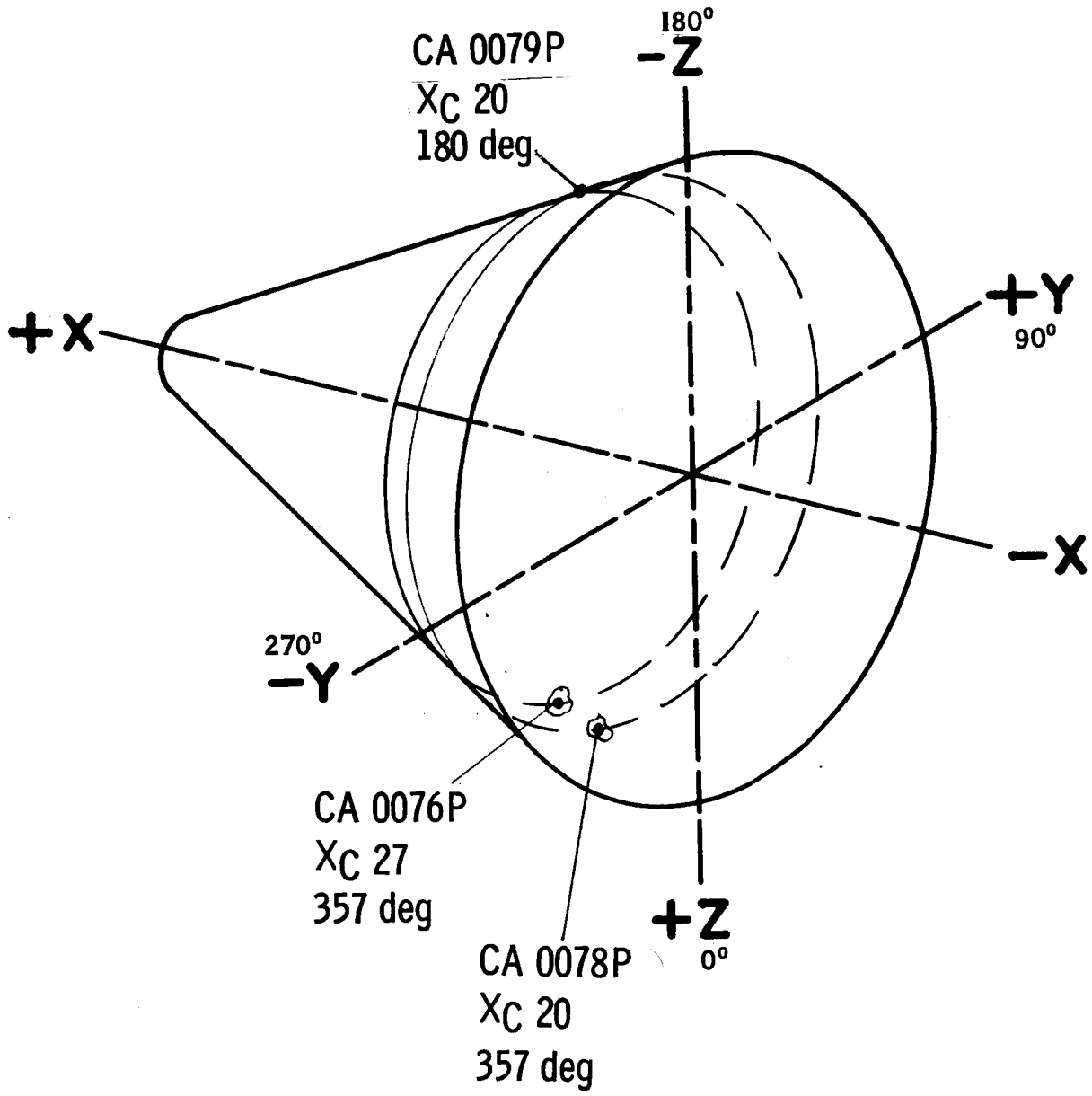
CA 0079P
X_C 20
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180°
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+Y
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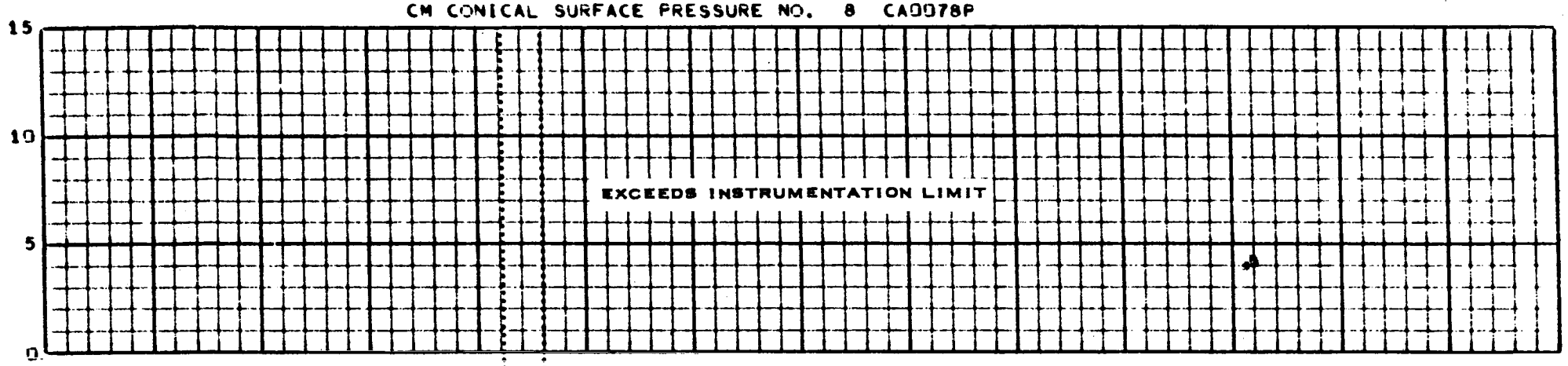
-X
270°
-Y
CA 0076P
X_C 27
357 deg
+Z
0°
CA 0078P
X_C 20
357 deg

00:10:24.60 S-IV BURNOUT
00:10:32.00 ORBIT INSERTION

APOLLO BP-13

~~CONFIDENTIAL~~

CM CONICAL SURFACE PRESSURE NO. 8 CA0078P



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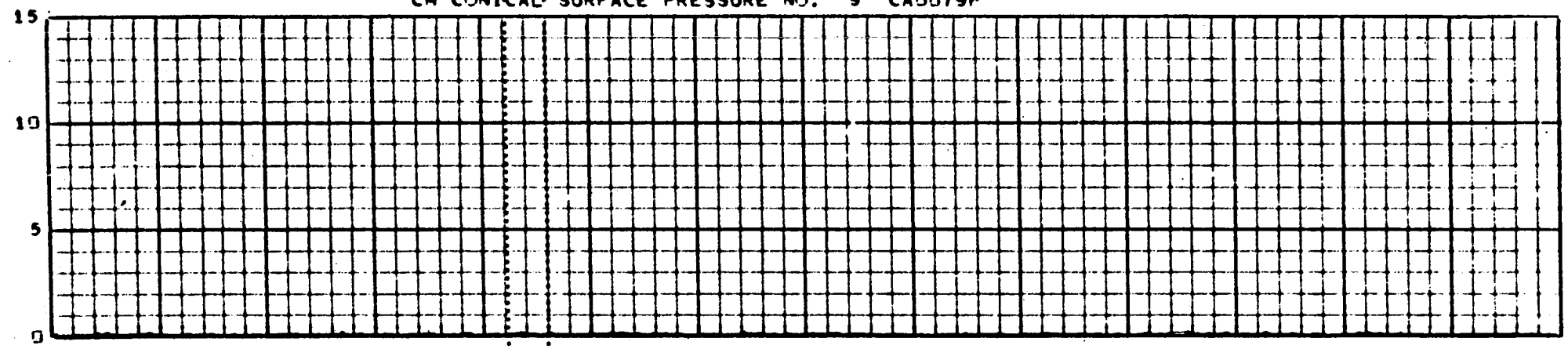
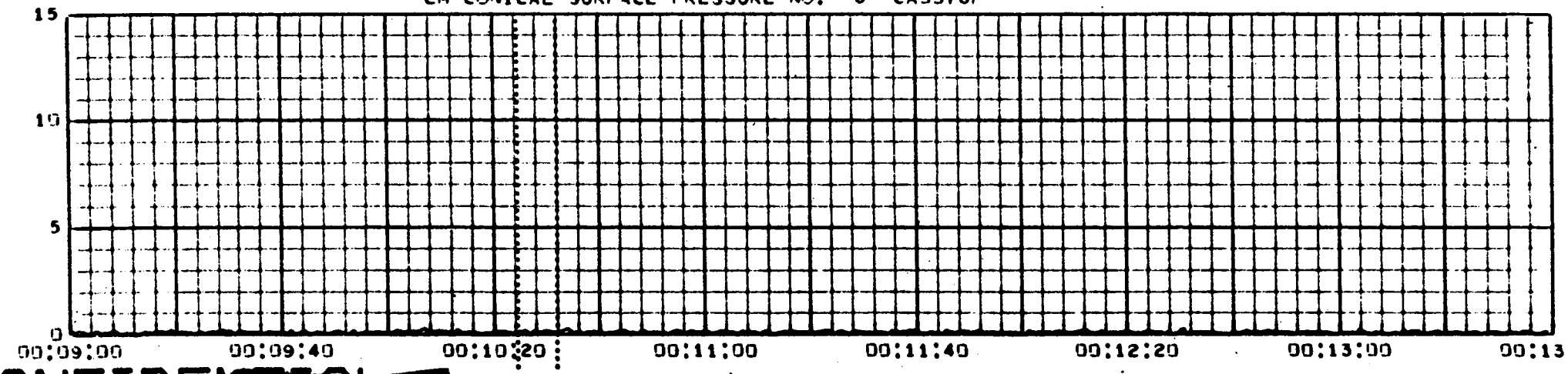


CM CONICAL SURFACE PRESSURE NO. 6 CA0076P



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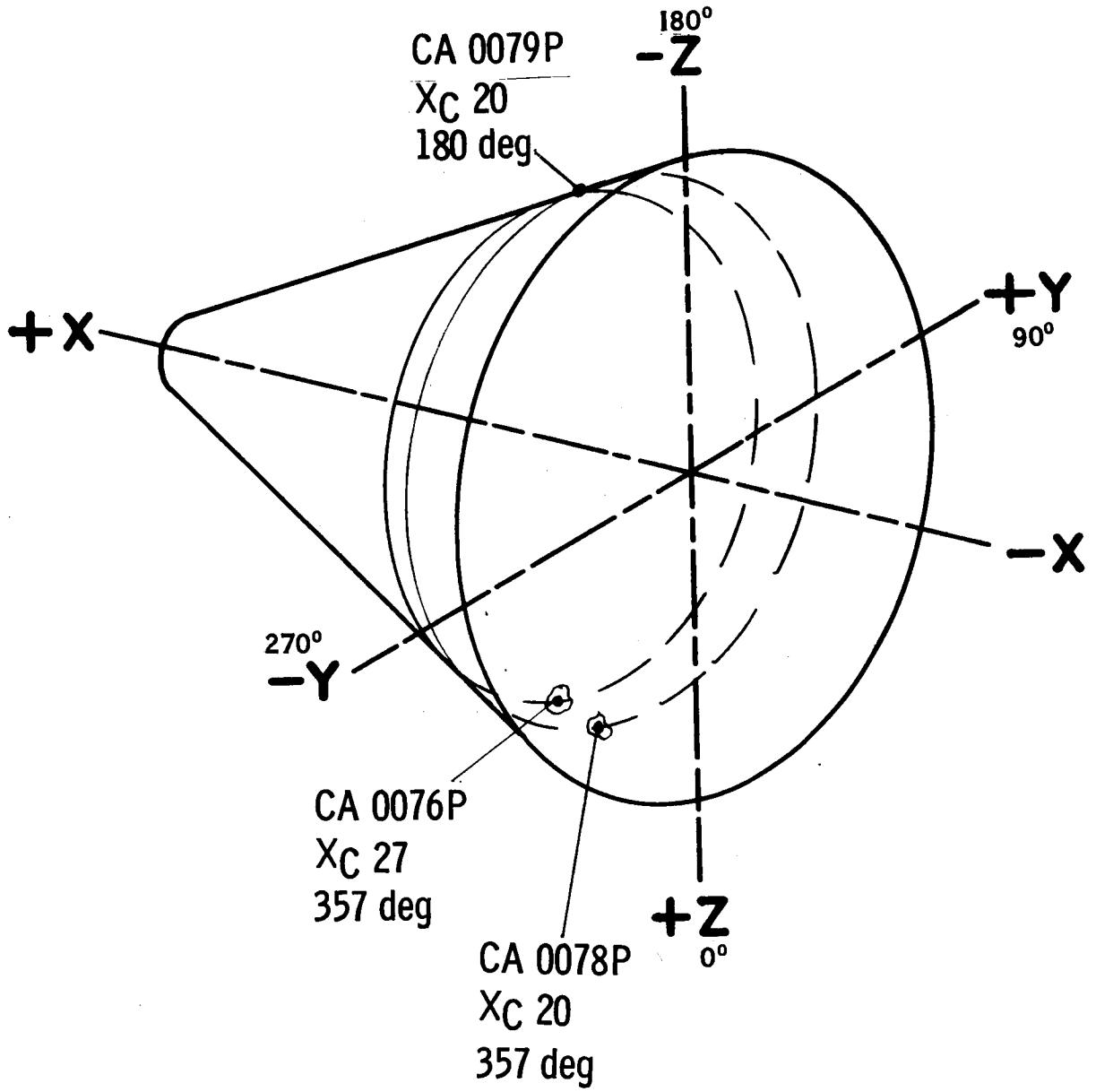
CA 0079P
X_C 20
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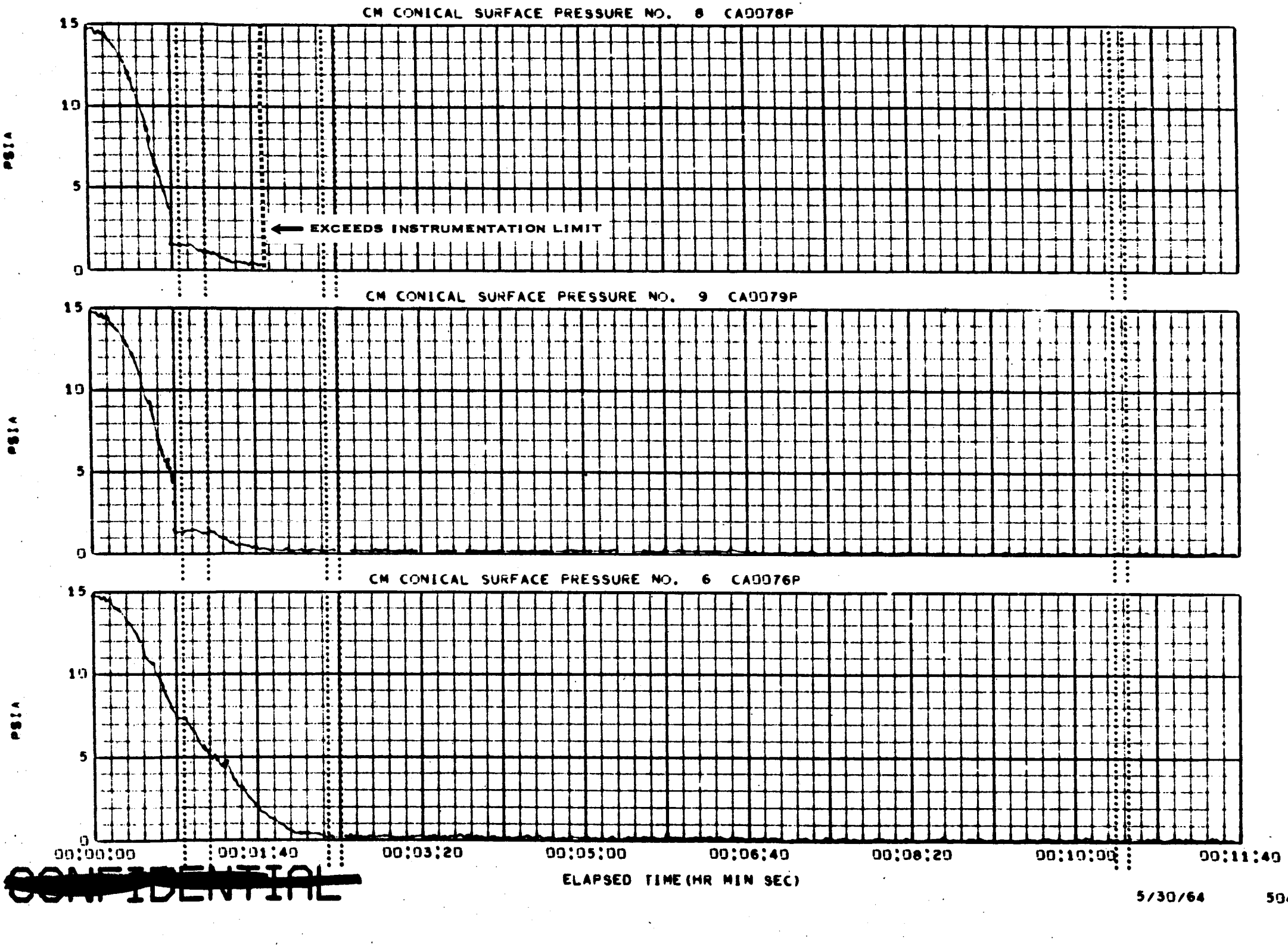
CA 0078P
X_C 20
357 deg
+Z
0°

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.88 S-1 INBD.ENG. CUT-OFF
00:02:30.90 S-IV IGNITION
00:10:24.60 S-IV BURNOUT
00:10:32.00 ORBIT INSERTION

APOLLO BP-13

~~CONFIDENTIAL~~



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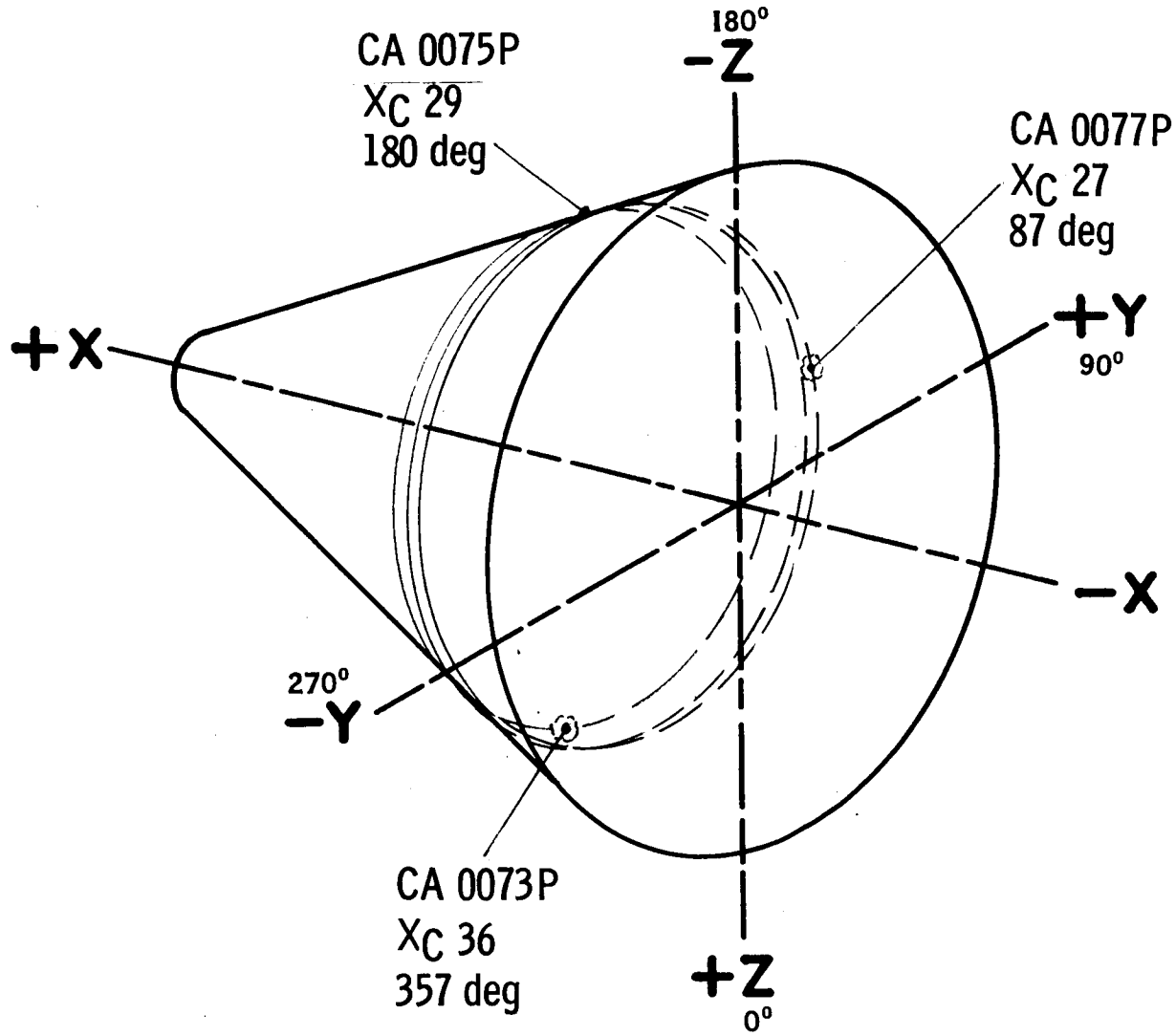
5/30/64 504


CA 0075P
X_C 29
180 deg
180°
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CA 0077P
X_C 27
87 deg
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-Y
CA 0073P
X_C 36
357 deg
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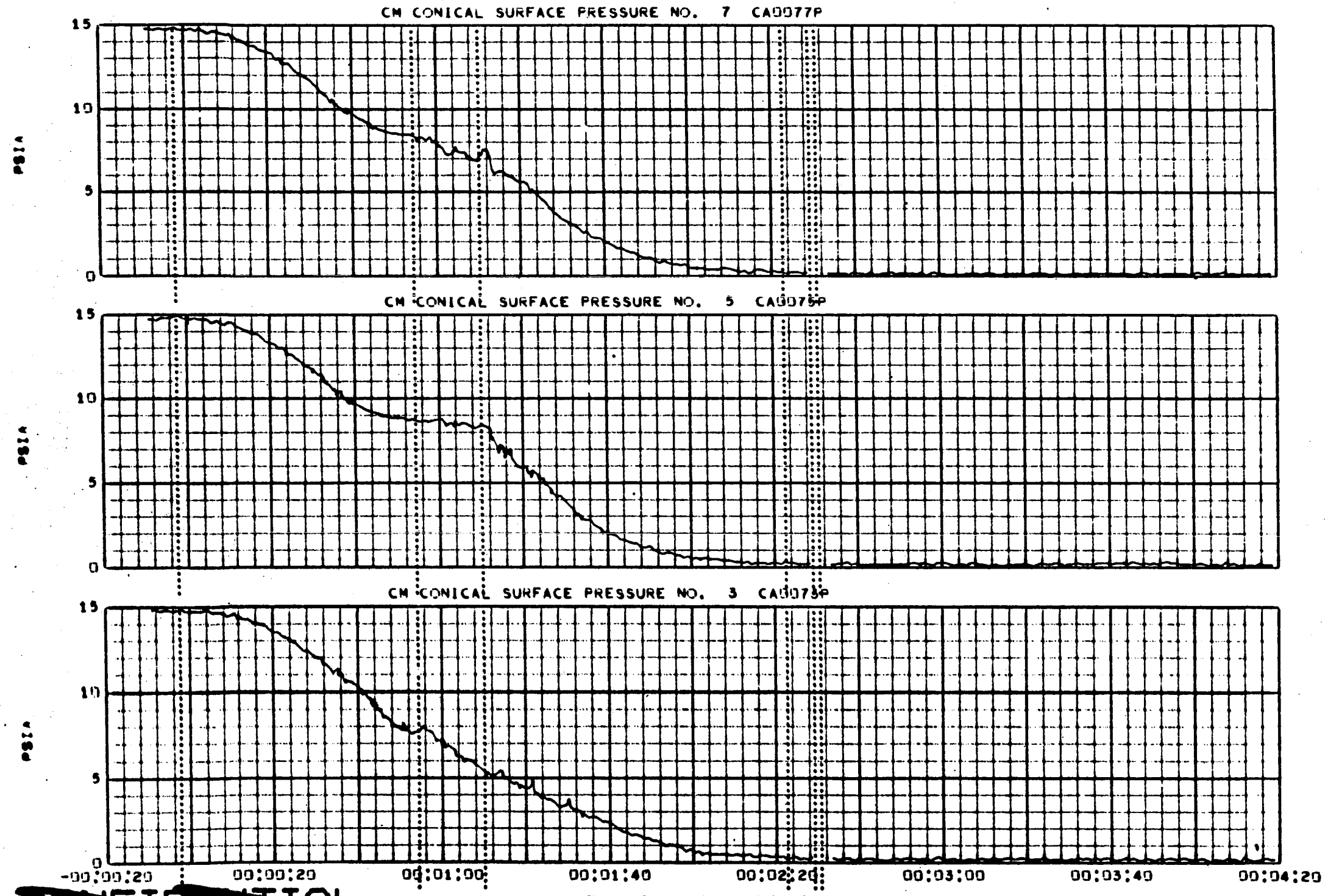
0°

-00:00:02.55 S-I IGNITION
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.88 S-I INBD.ENG. CUT-OFF
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION

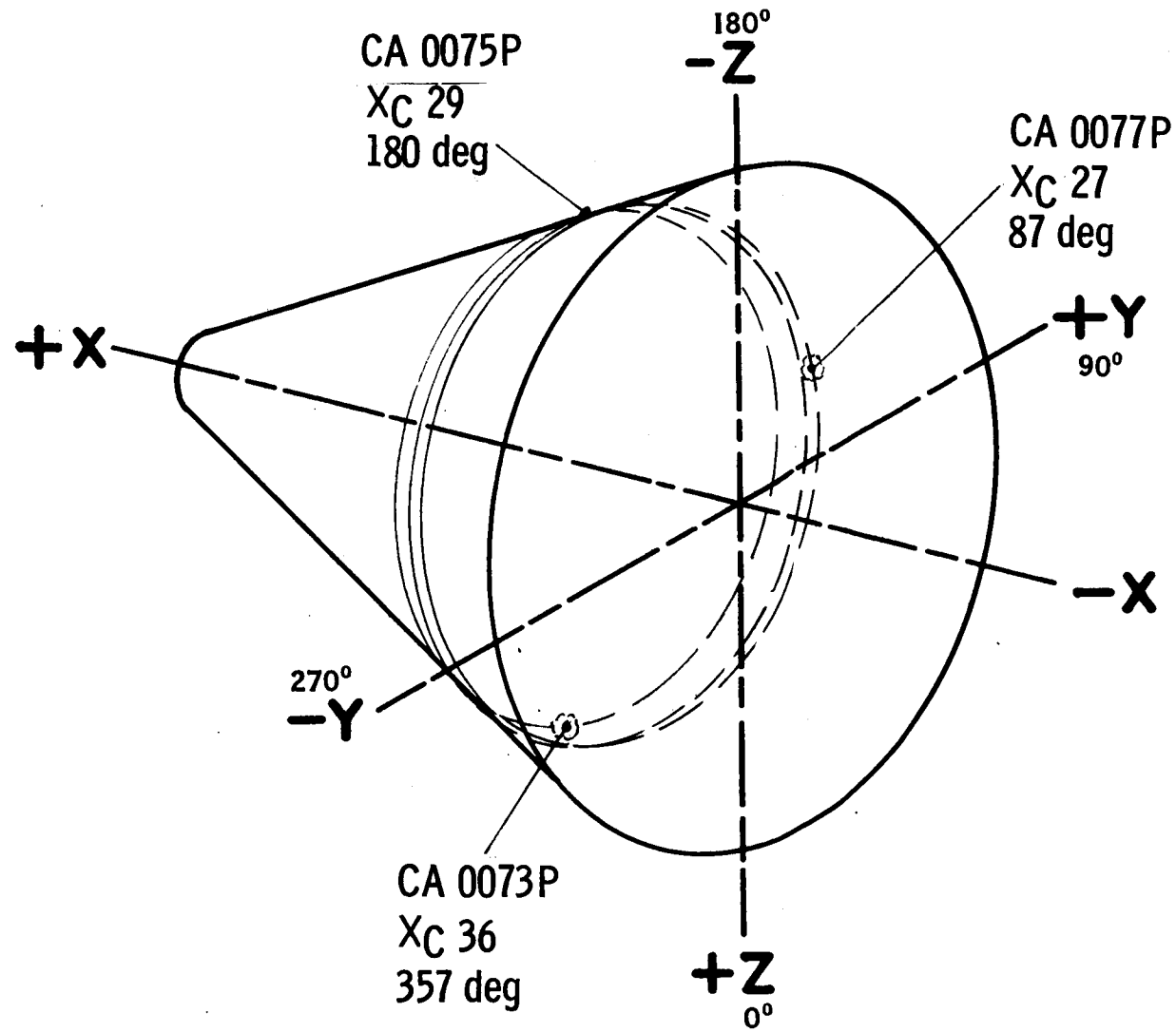
APOLLO BP-13

CONFIDENTIAL



CONFIDENTIAL

5/30/64 506


CA 0075P
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CA 0077P
X_C 27
87 deg
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270°
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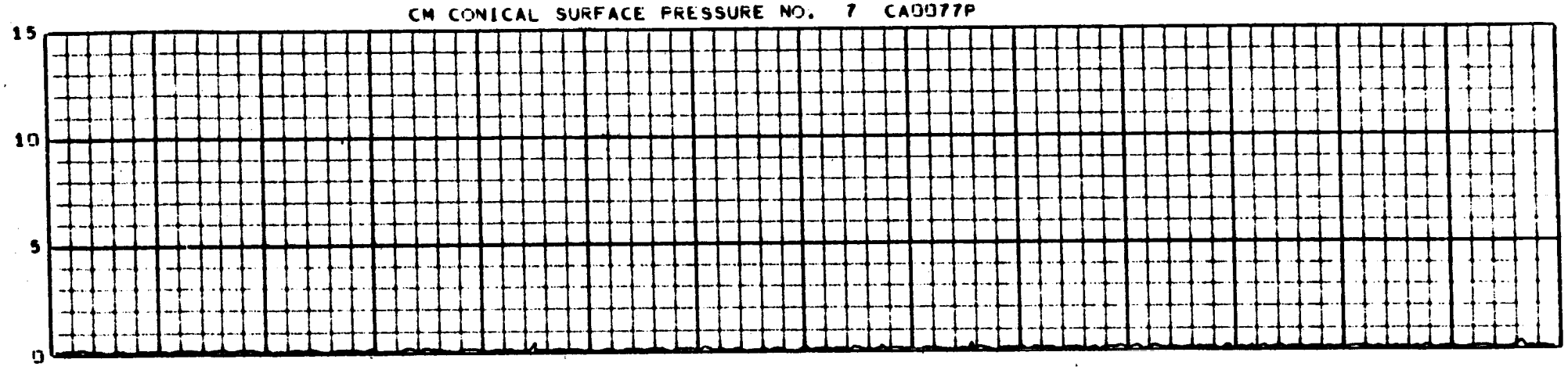
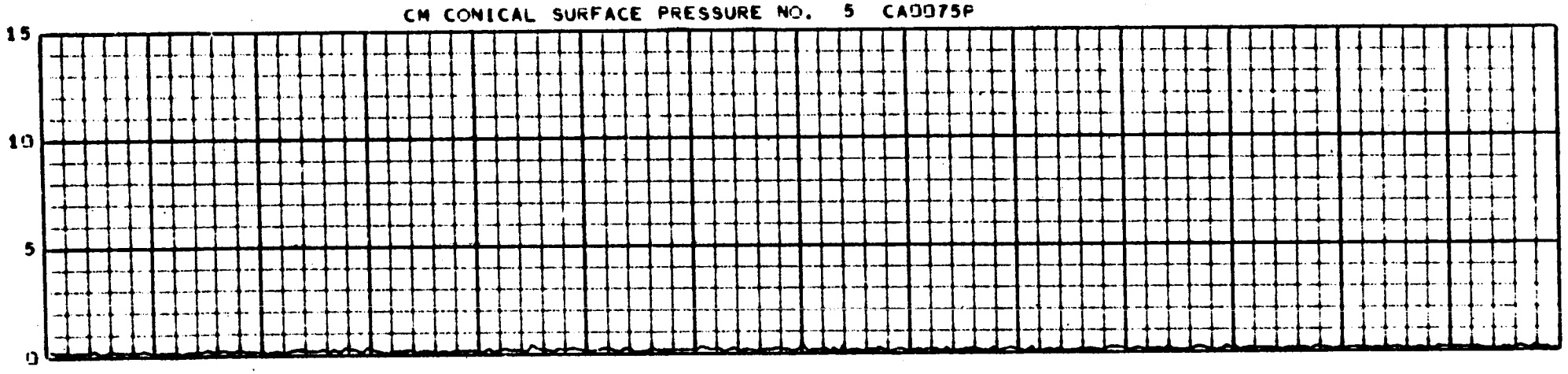
CA 0073P
X_C 36
357 deg
+Z
0°

~~CONFIDENTIAL~~

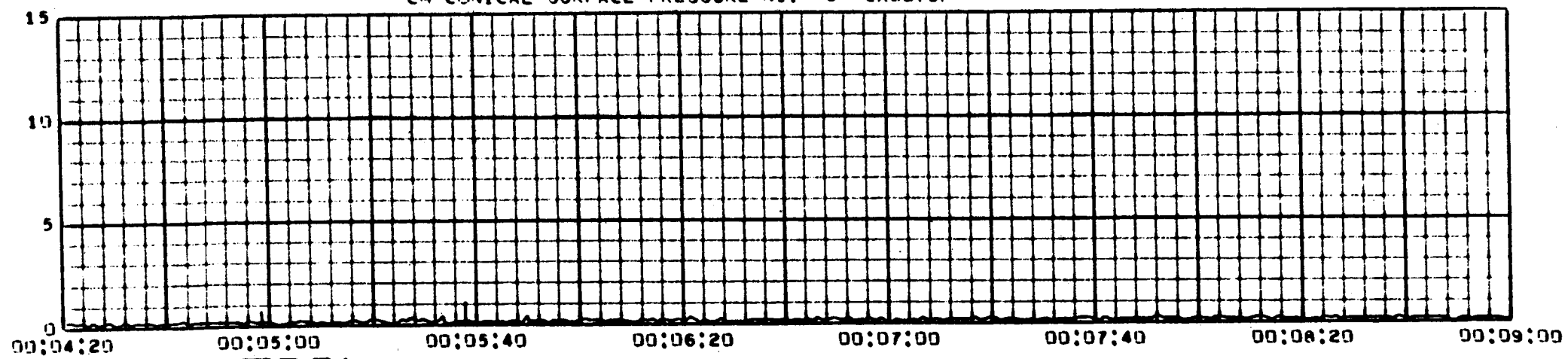
CM CONICAL SURFACE PRESSURE NO. 7 CA0077P



CM CONICAL SURFACE PRESSURE NO. 5 CA0075P



CM CONICAL SURFACE PRESSURE NO. 3 CA0073P



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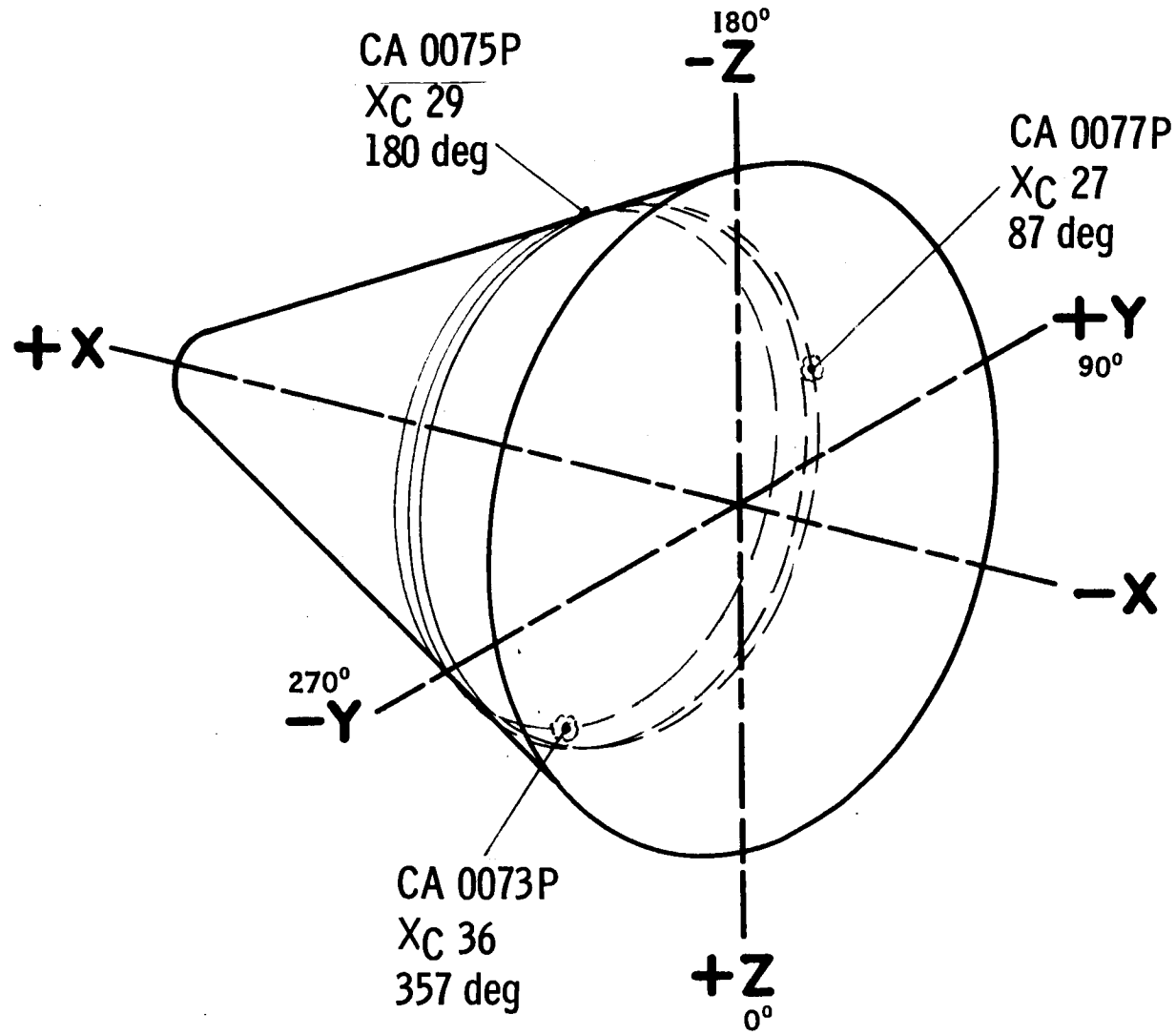
180°
-Z
CA 0075P
X_C 29
180 deg
CA 0077P
X_C 27
87 deg
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90°
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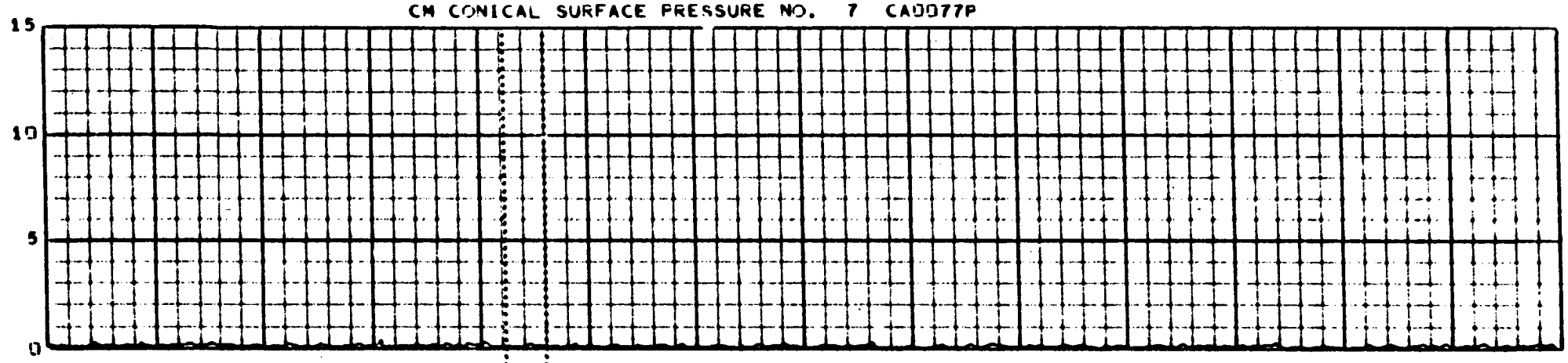
270°
-Y
CA 0073P
X_C 36
357 deg
+Z
0°

00:10:24.60 S-IV BURNOUT
00:10:32.00 ORBIT INSERTION

APOLLO BP-13

~~CONFIDENTIAL~~

CM CONICAL SURFACE PRESSURE NO. 7 CA0077P



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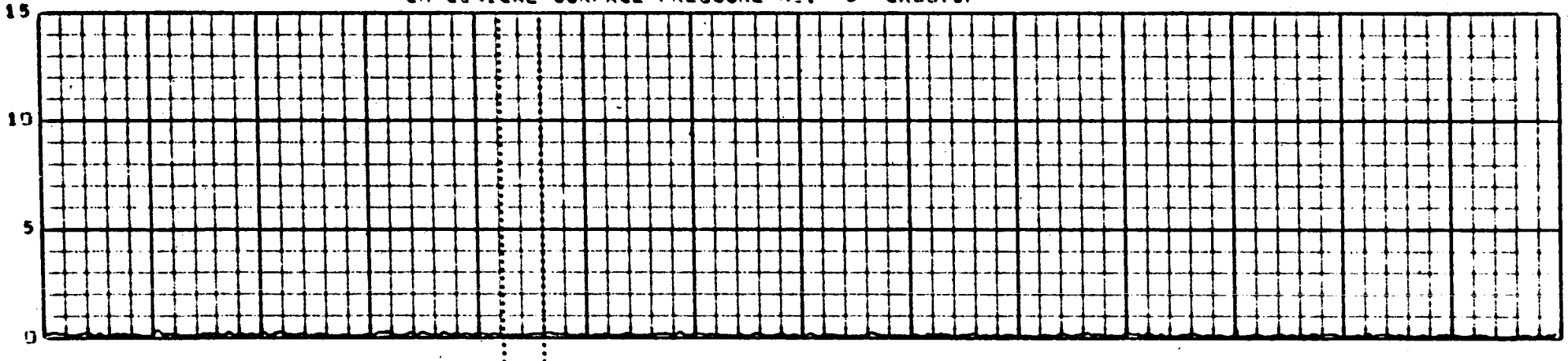
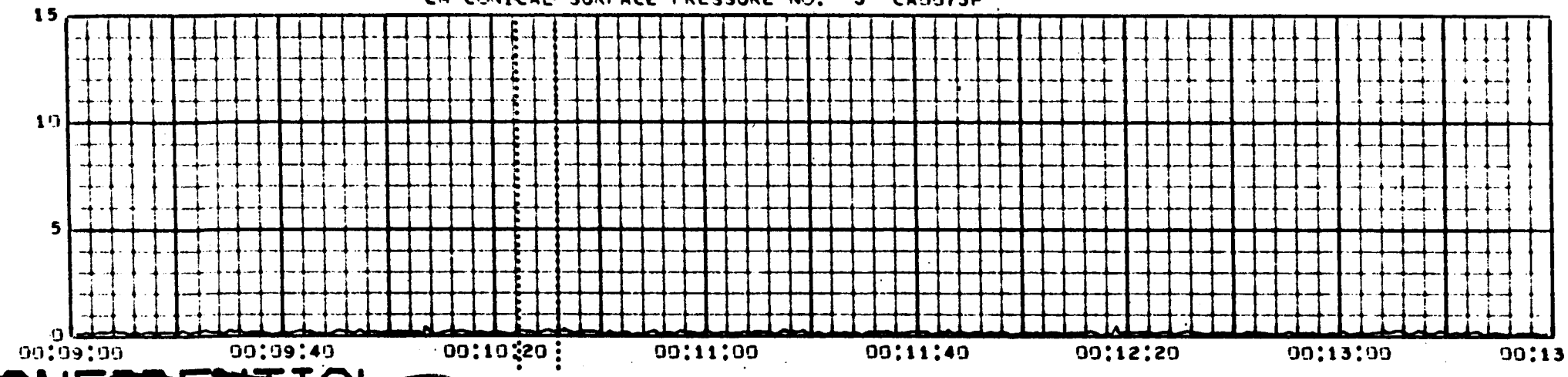


CM CONICAL SURFACE PRESSURE NO. 3 CA0073P

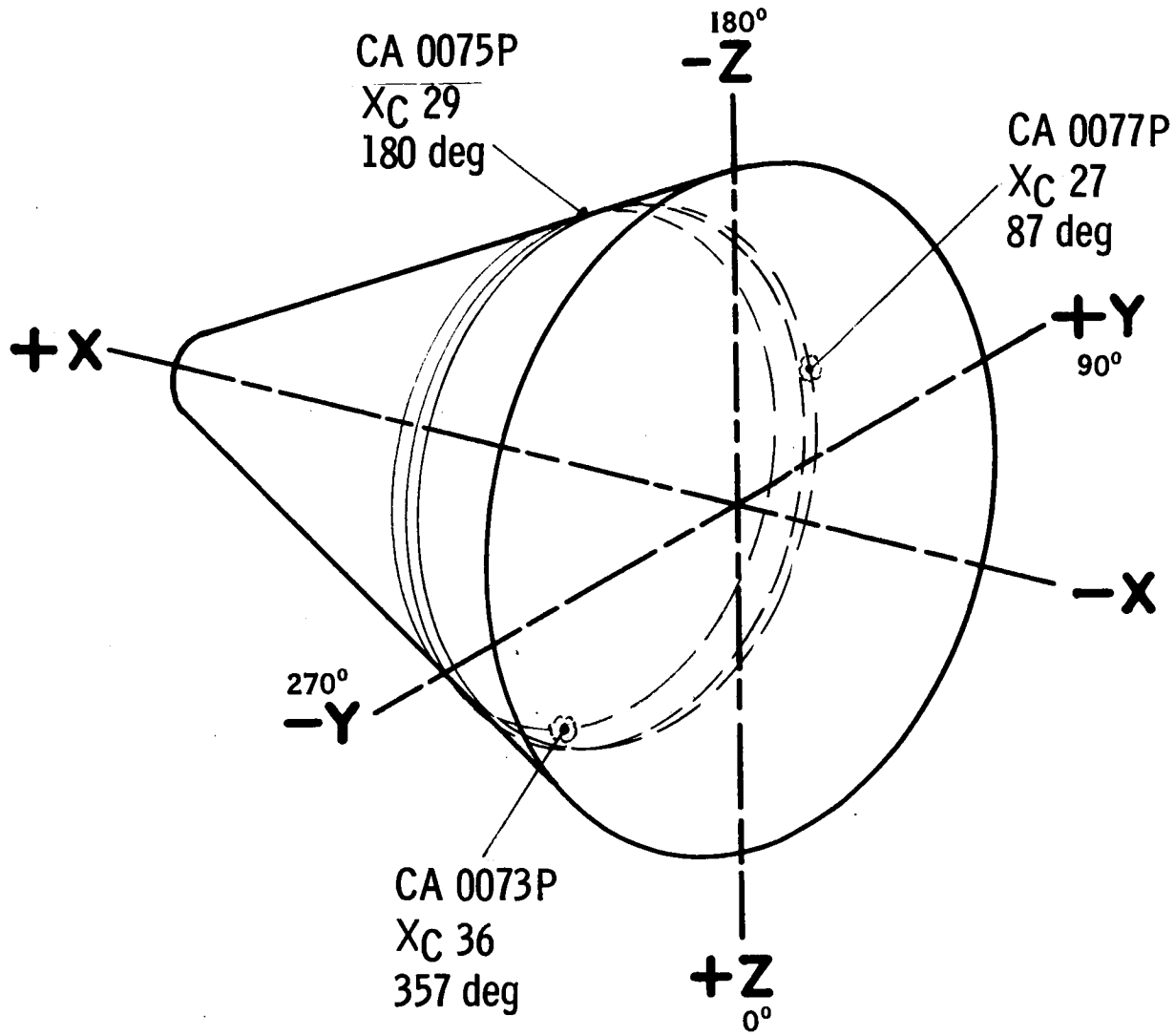


00:09:00 00:09:40 00:10:20 00:11:00 00:11:40 00:12:20 00:13:00 00:13:40

ELAPSED TIME (HR MIN SEC)

~~CONFIDENTIAL~~

5/30/64 508


CA 0075P
X_C 29
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X_C 27
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CA 0073P
X_C 36
357 deg
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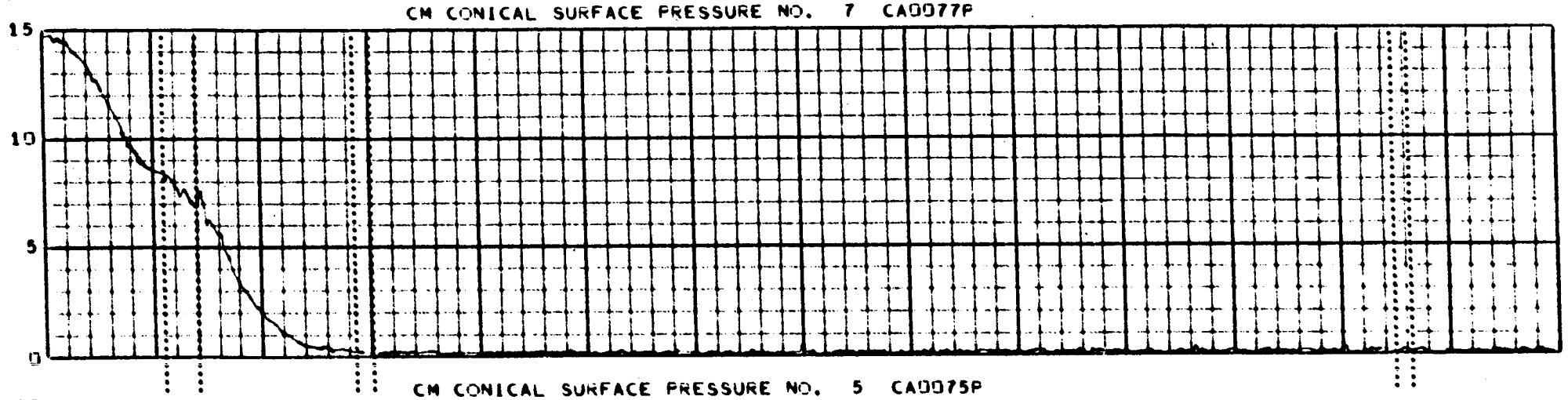
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.88 S-I INBD.ENG. CUT-OFF
00:02:30.90 S-IV IGNITION
00:10:24.60 S-IV BURNOUT
00:10:32.00 ORBIT INSERTION

APOLLO BP-13

CONFIDENTIAL

CM CONICAL SURFACE PRESSURE NO. 7 CA0077P



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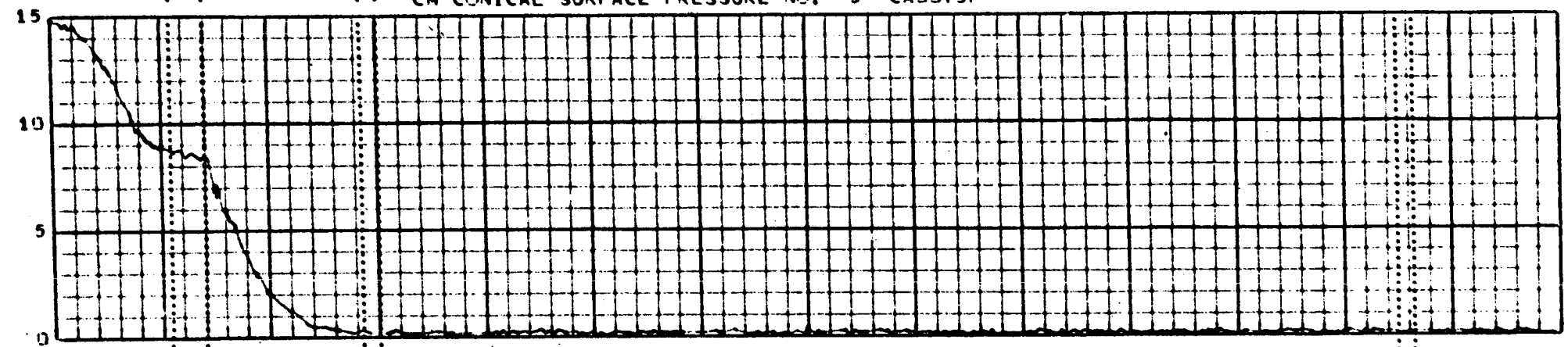
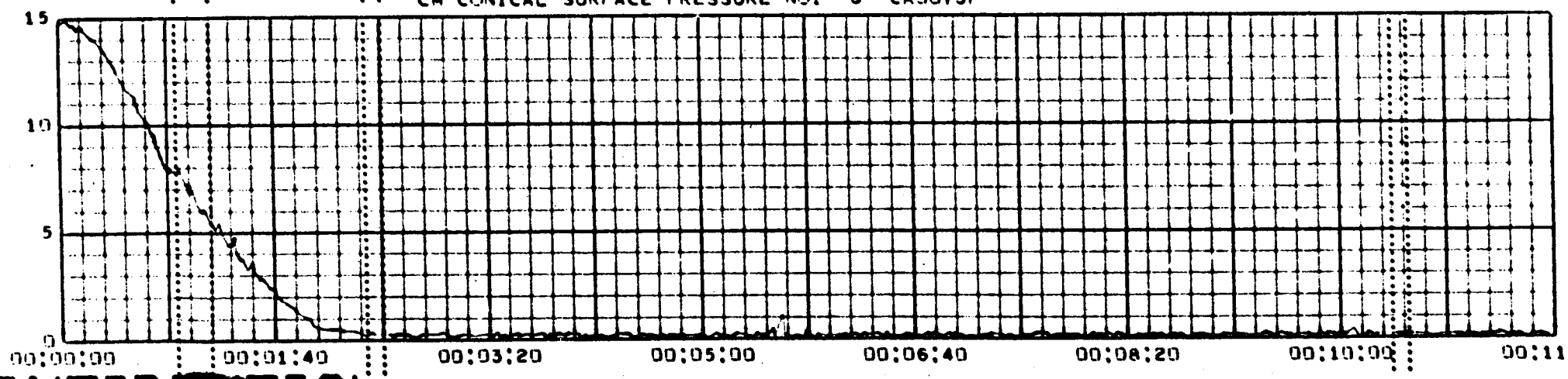
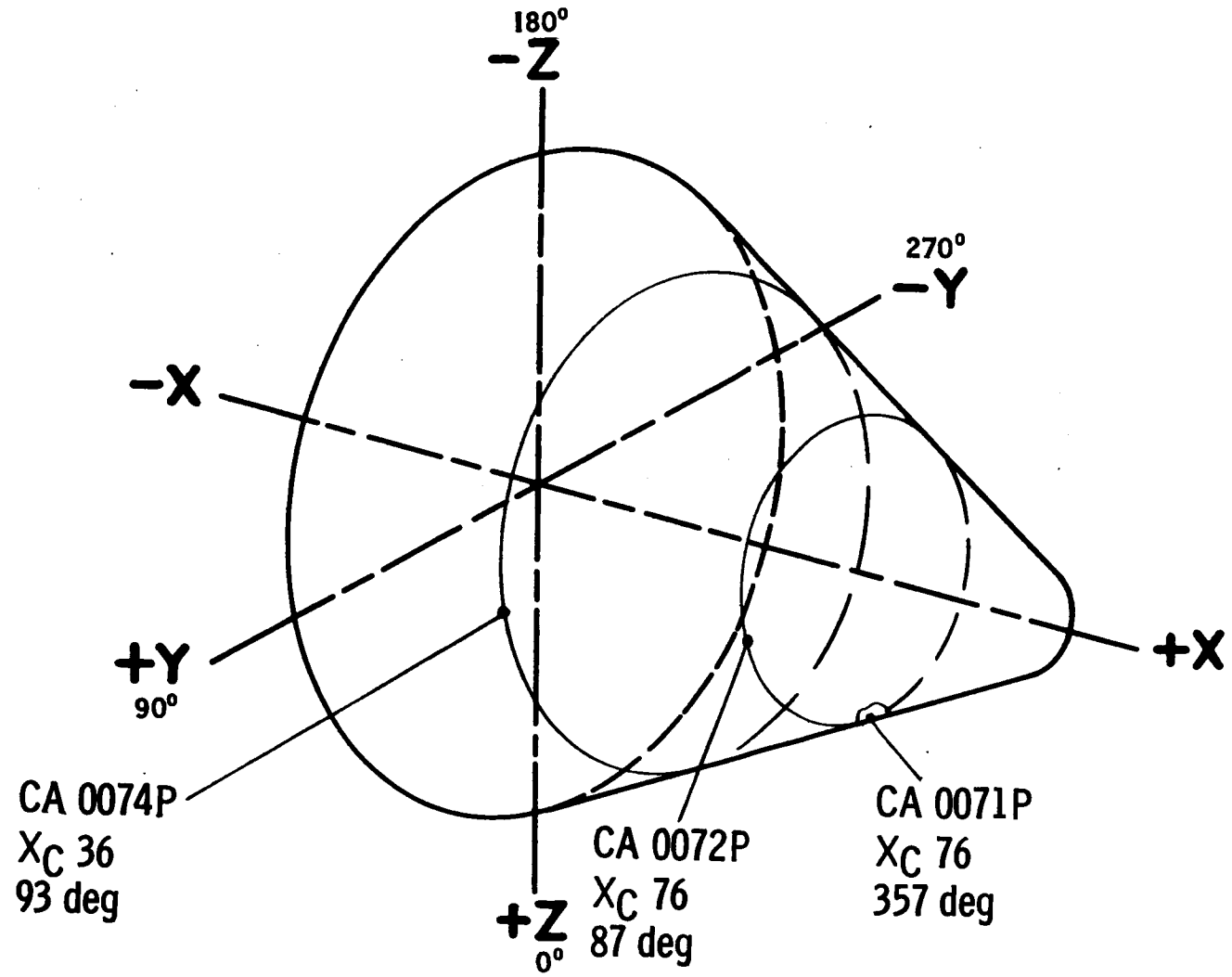


CM CONICAL SURFACE PRESSURE NO. 3 CA0073P



CONFIDENTIAL


180°
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CA 0074P
X_C 36
93 deg
CA 0072P
X_C 76
87 deg
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X_C 76
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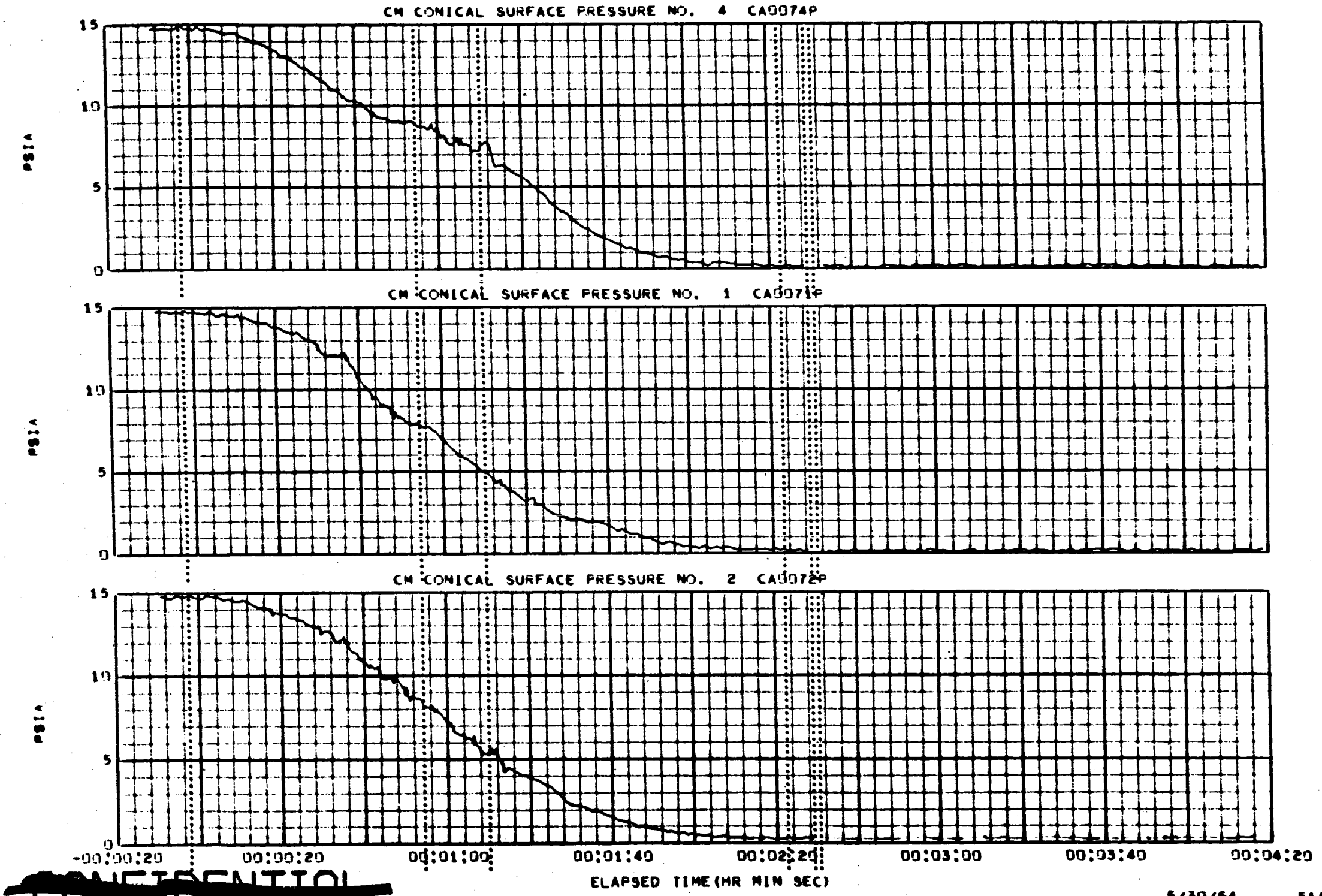
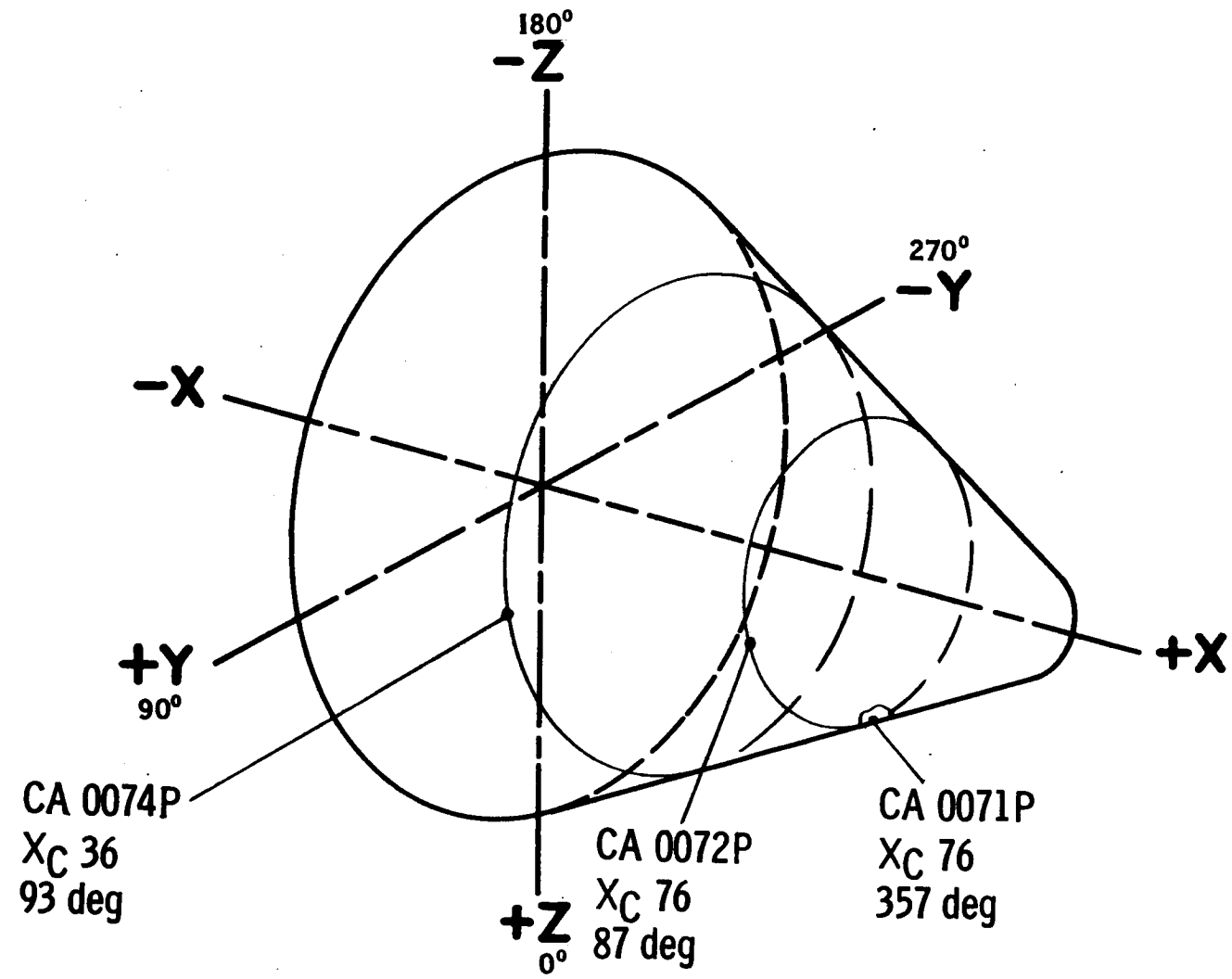
-00:00:02.55 S-I IGNITION
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.88 S-I INBD.ENG. CUT-OFF
00:02:29.08 S-I CUT-OFF
00:02:30.90 S-IV IGNITION




180°
-Z
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-Y
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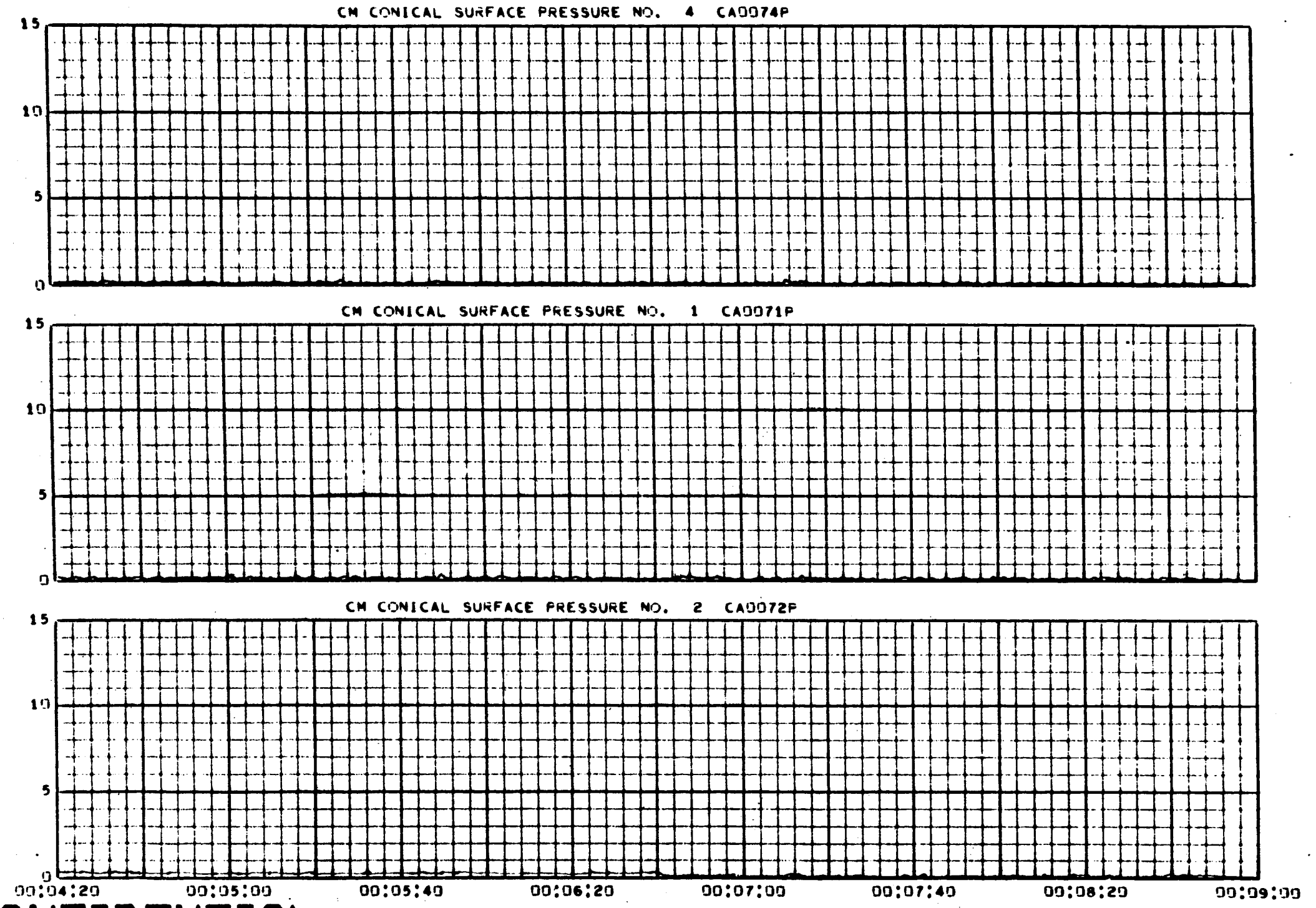
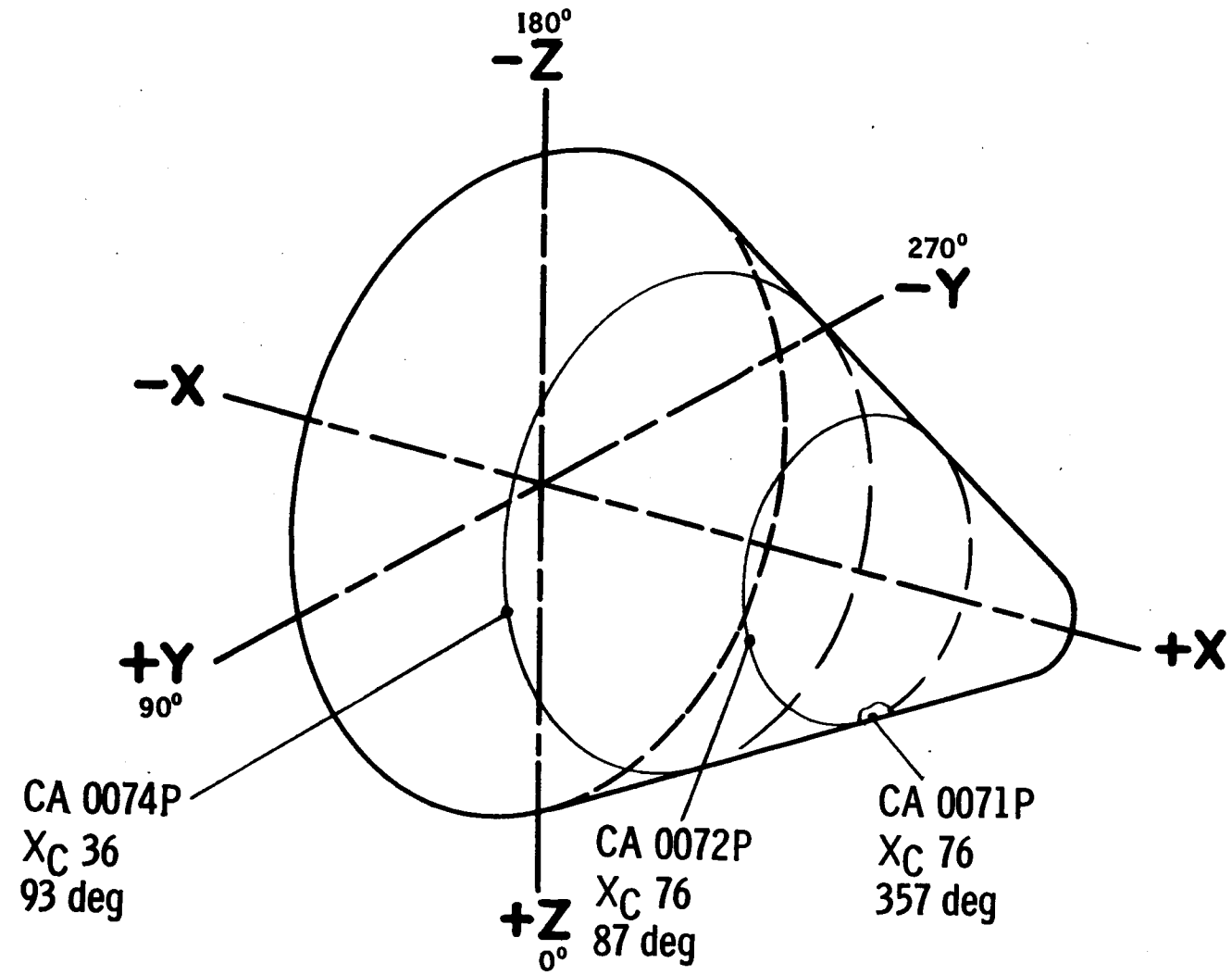
90°
+X
+Z
0°
CA 0074P
X_C 36
93 deg
CA 0072P
X_C 76
87 deg
CA 0071P
X_C 76
357 deg

CONFIDENTIAL



CONFIDENTIAL

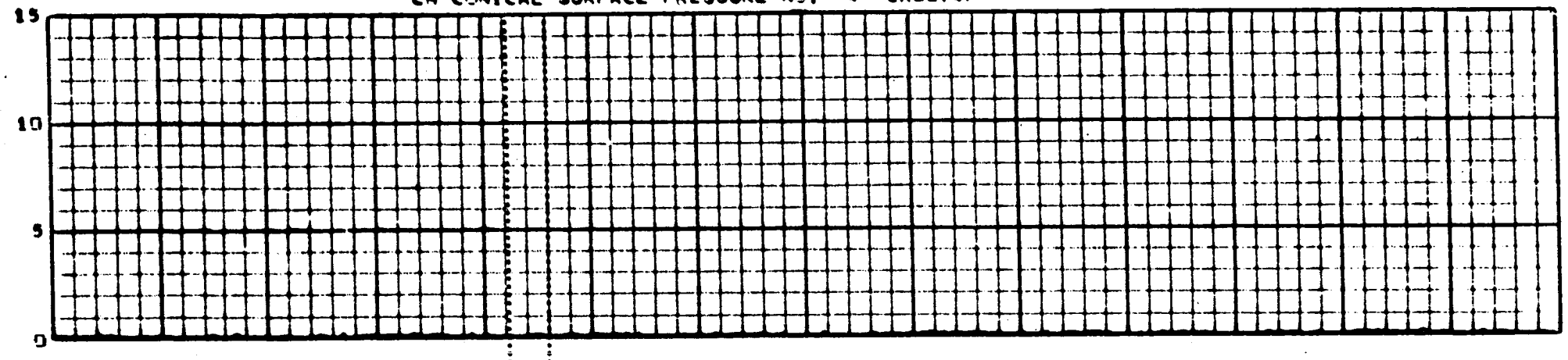

180°
-Z
270°
-Y
-X
+Y
90°
+X
CA 0074P
X_C 36
93 deg
+Z
0°
CA 0072P
X_C 76
87 deg
CA 0071P
X_C 76
357 deg

00:10:24.60 S-IV BURNOUT
00:10:32.00 ORBIT INSERTION

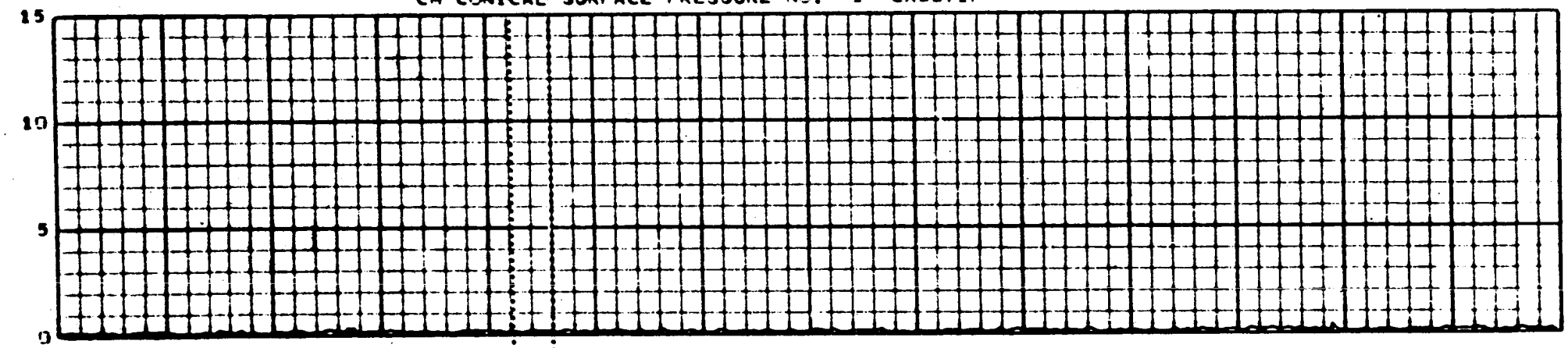
APOLLO BP-13

~~CONFIDENTIAL~~

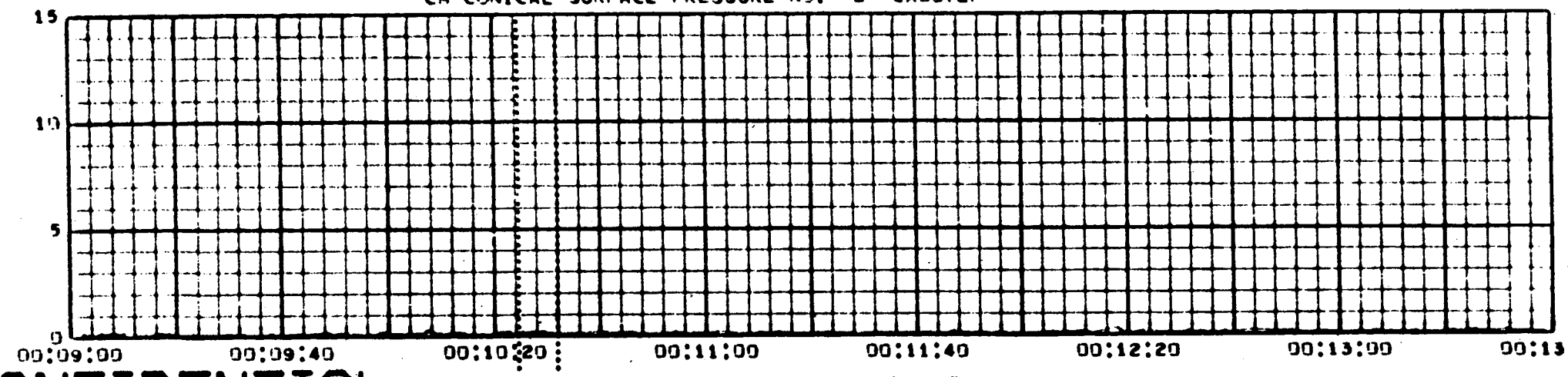
CM CONICAL SURFACE PRESSURE NO. 4 CA0074P



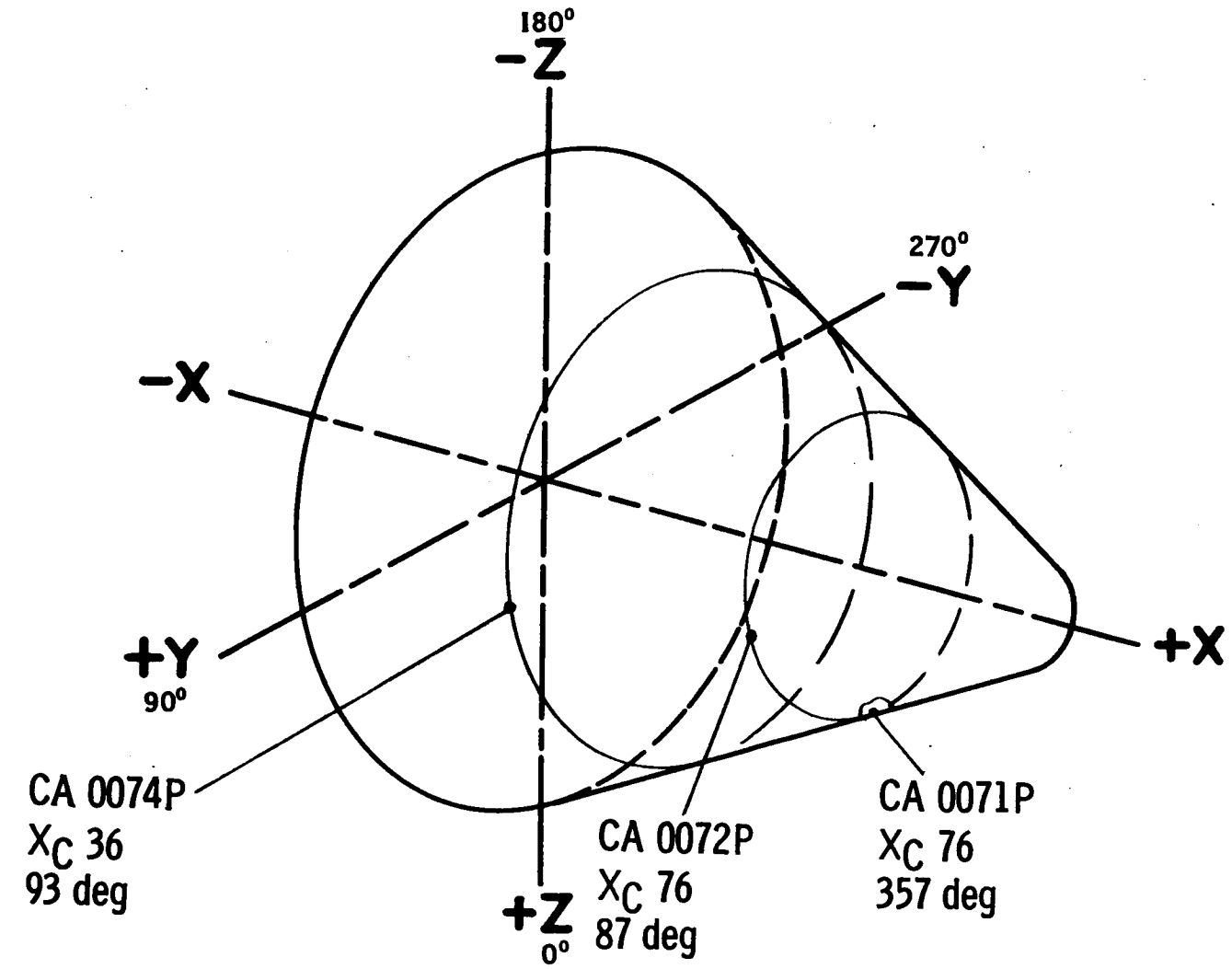
CM CONICAL SURFACE PRESSURE NO. 1 CA0071P



CM CONICAL SURFACE PRESSURE NO. 2 CA0072P



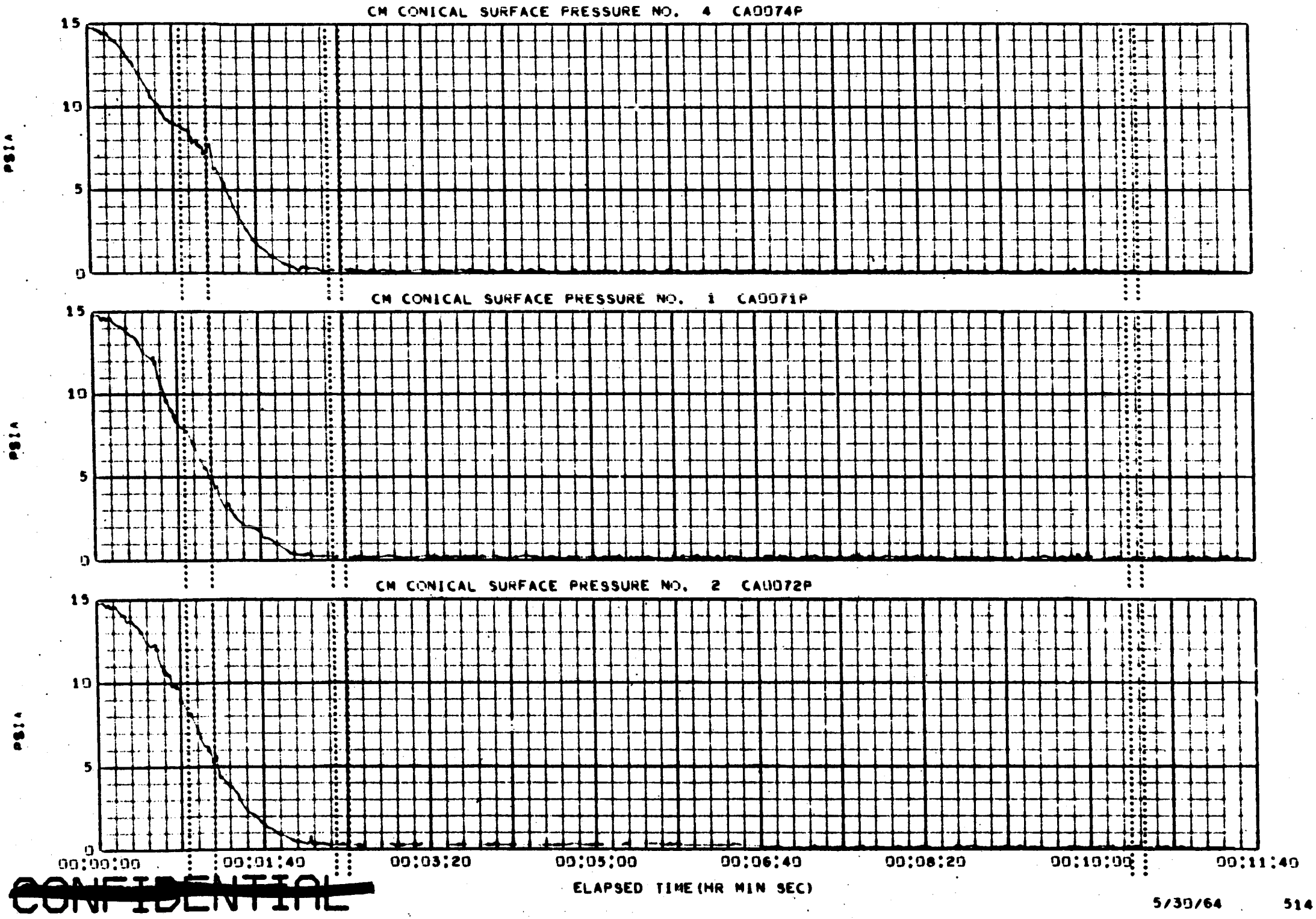
~~CONFIDENTIAL~~


180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°
CA 0074P
X_C 36
93 deg
CA 0072P
X_C 76
87 deg
CA 0071P
X_C 76
357 deg

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:22.88 S-I INBD.ENG. CUT-OFF
00:02:30.90 S-IV IGNITION
00:10:24.60 S-IV BURNOUT
00:10:32.00 ORBIT INSERTION

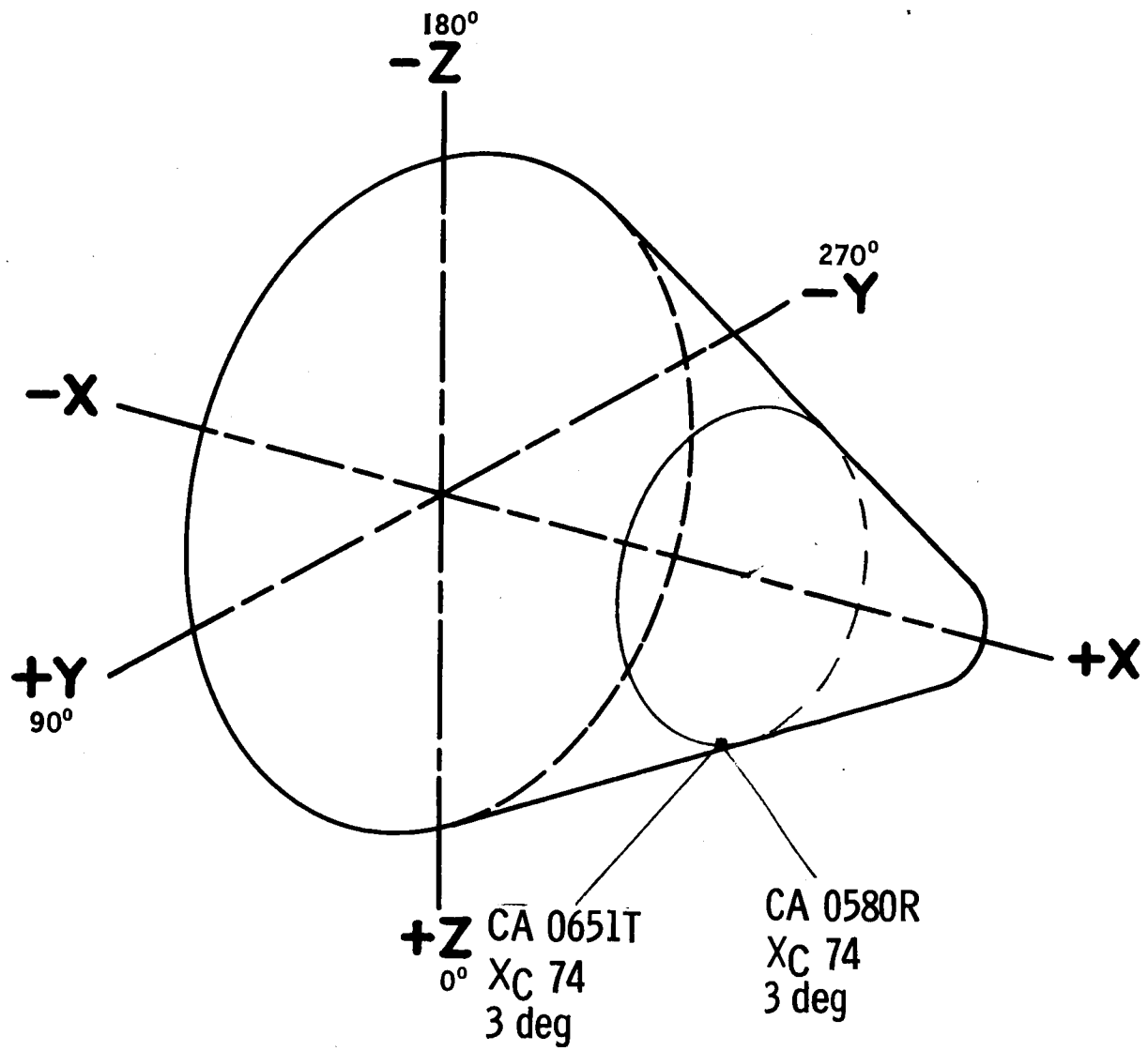
APOLLO BP-13

~~CONFIDENTIAL~~



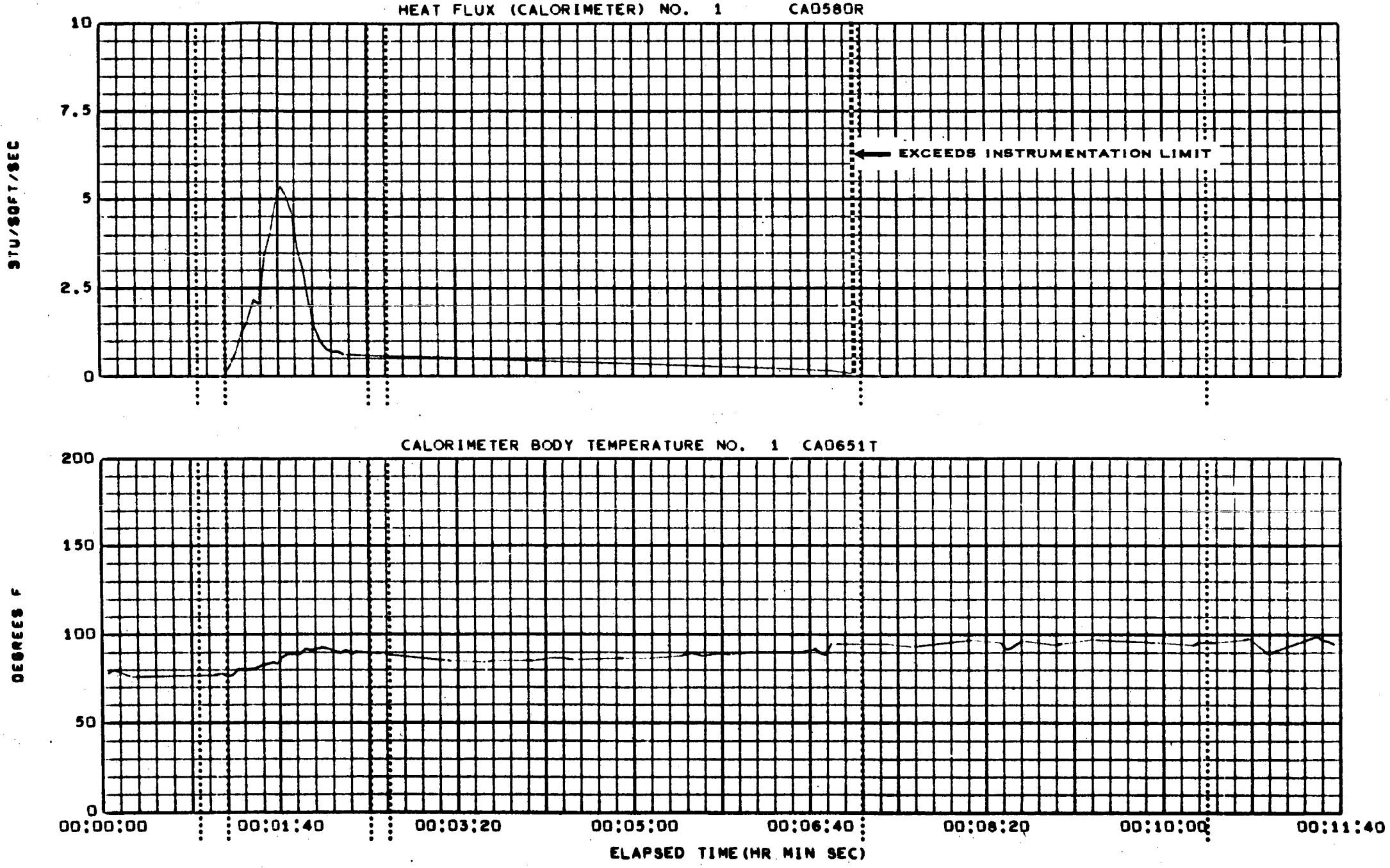
~~CONFIDENTIAL~~

5/30/64 514

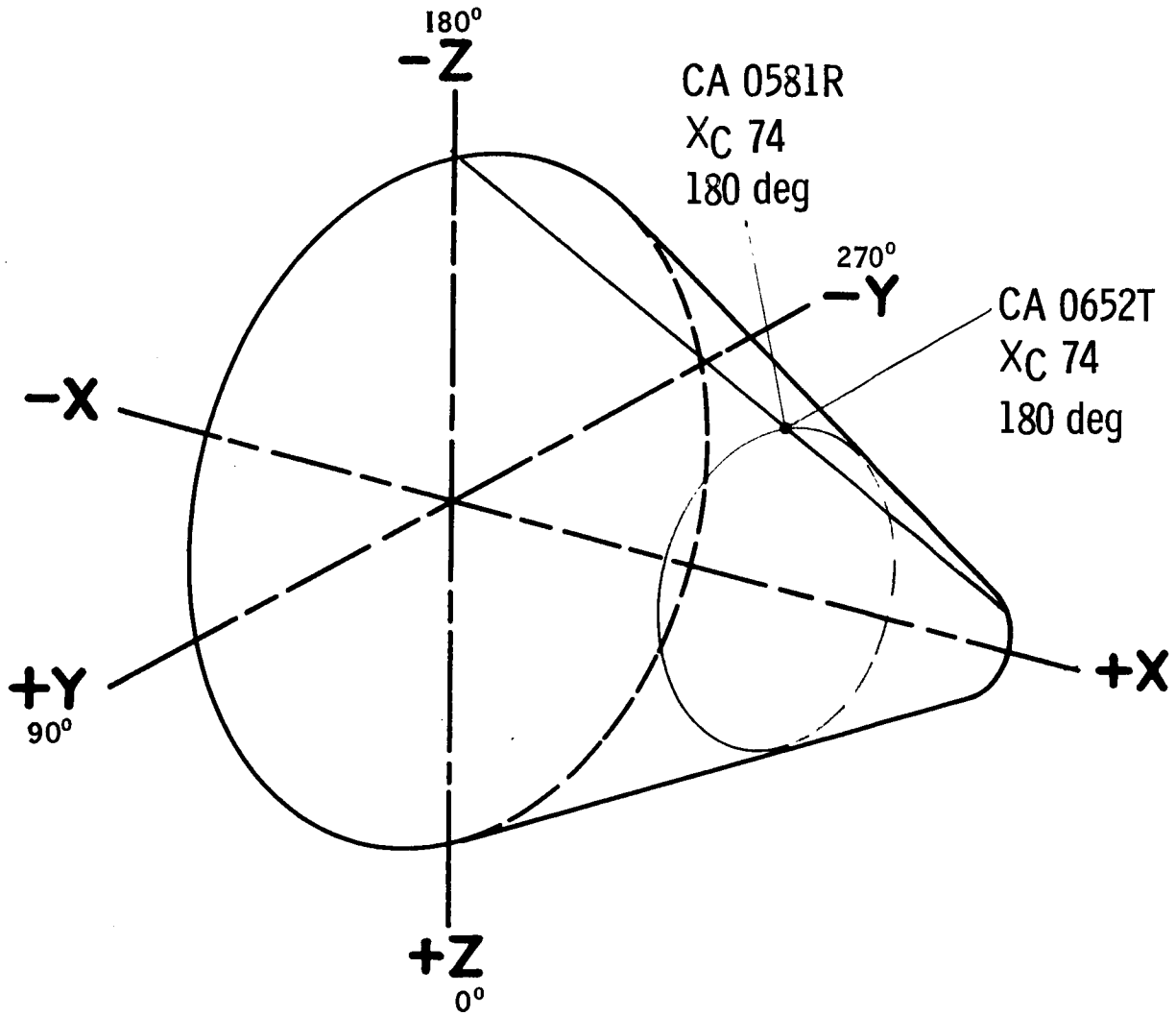

180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°
CA 0651T
XC 74
3 deg
CA 0580R
XC 74
3 deg

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

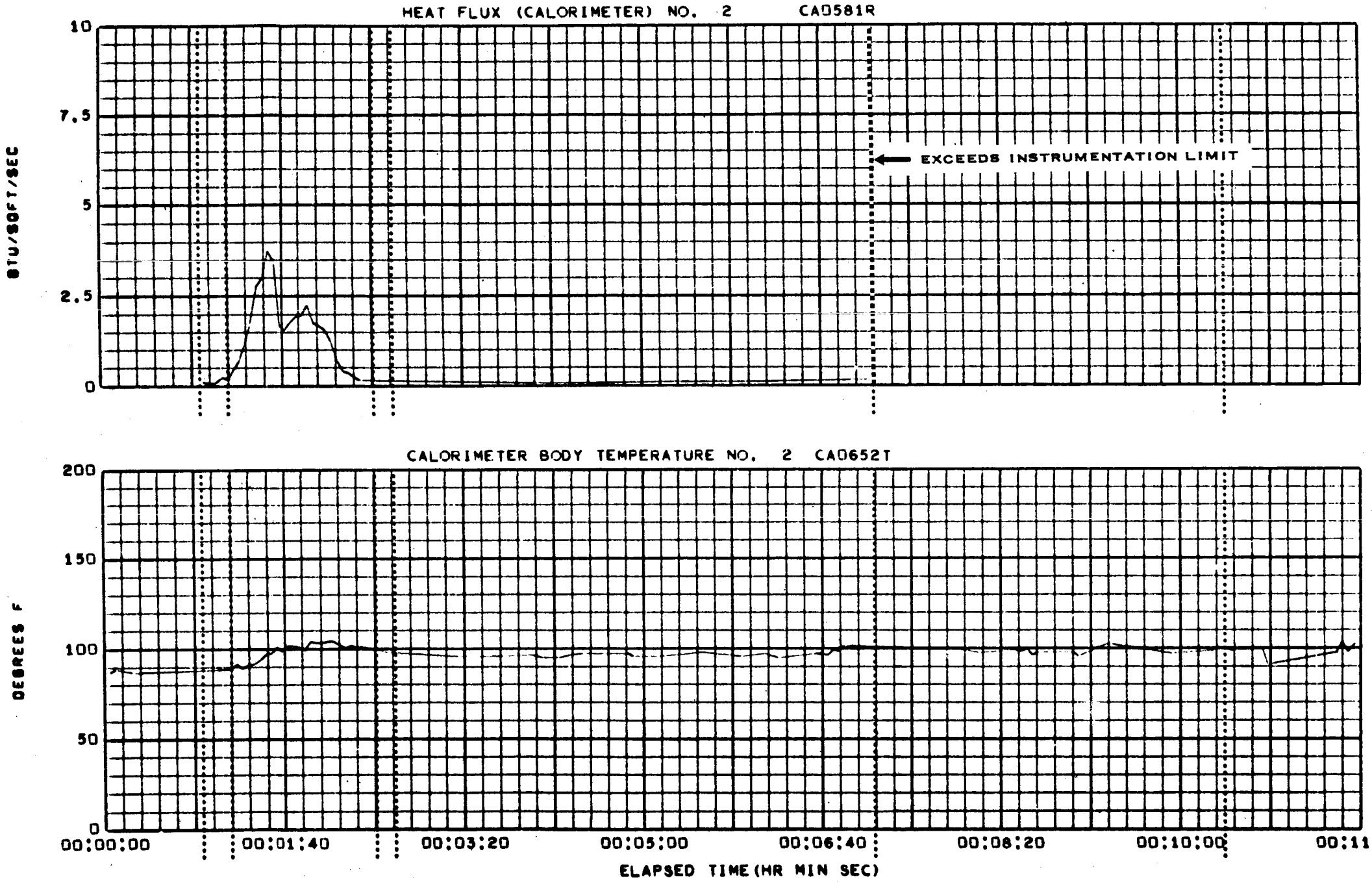


~~CONFIDENTIAL~~


180°
-Z
CA 0581R
X_C 74
180 deg
270°
-Y
CA 0652T
X_C 74
180 deg
-X
+Y
90°
+X
+Z
0°

CONFIDENTIAL

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT



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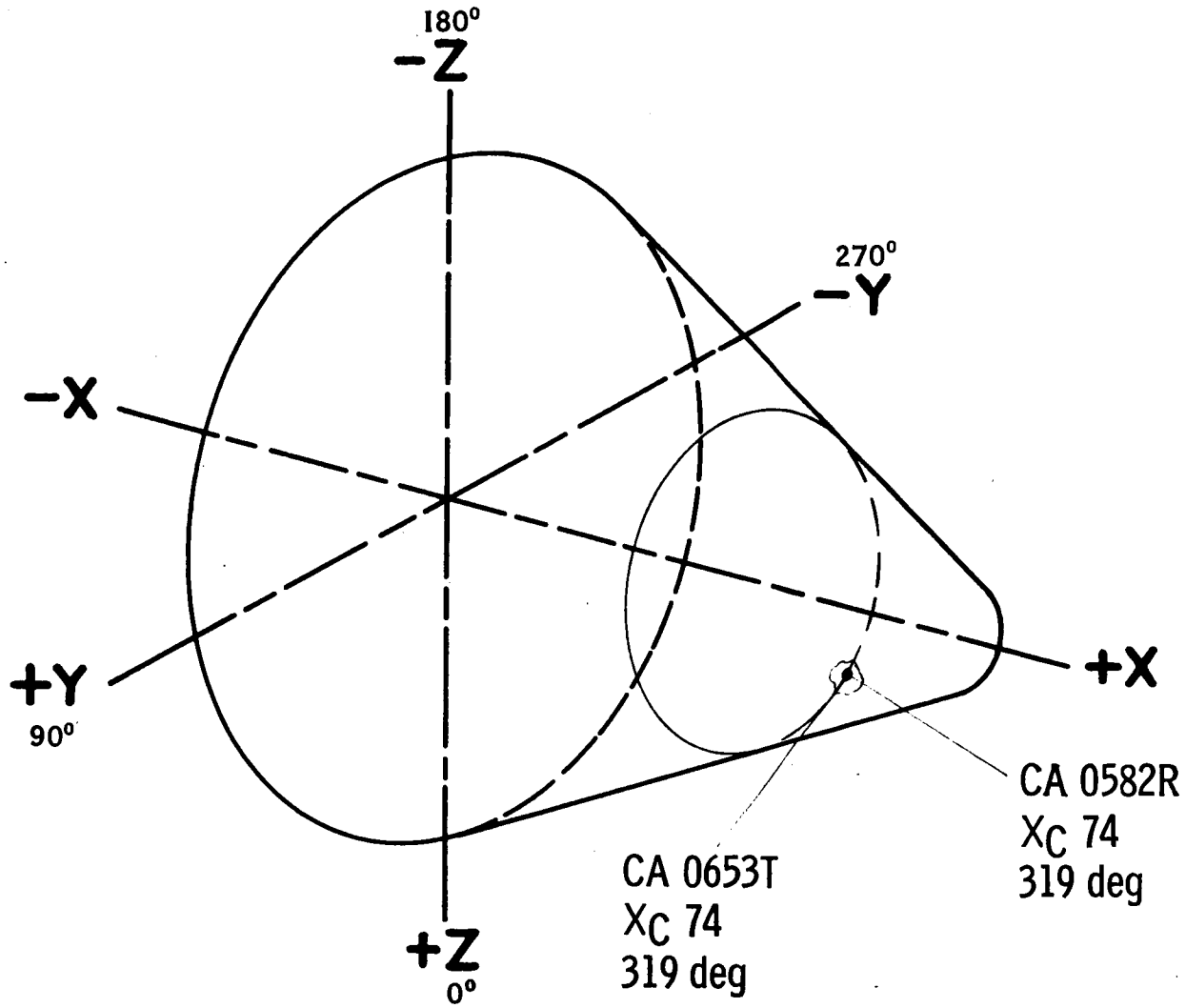
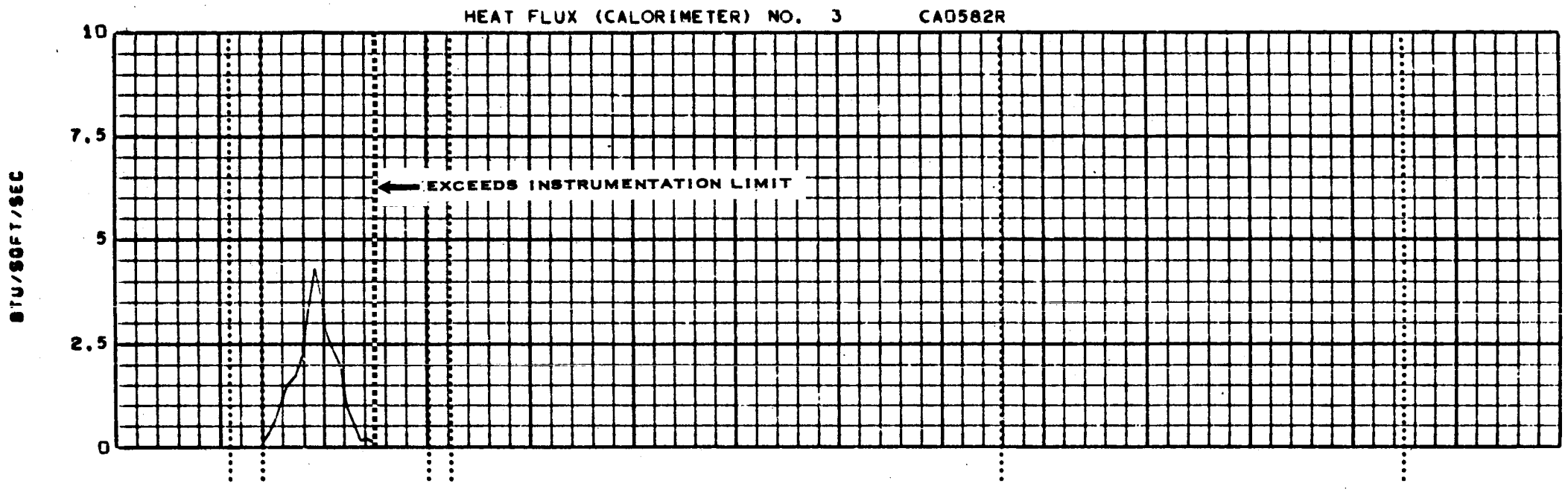
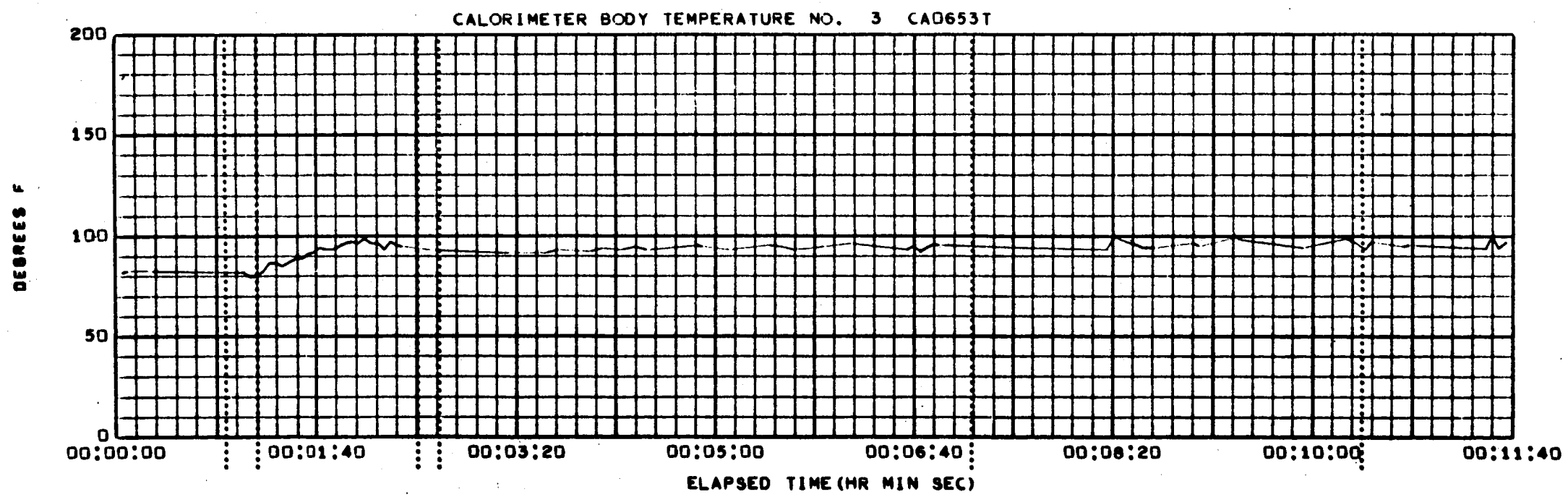

180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°
CA 0653T
X_C 74
319 deg
CA 0582R
X_C 74
319 deg

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

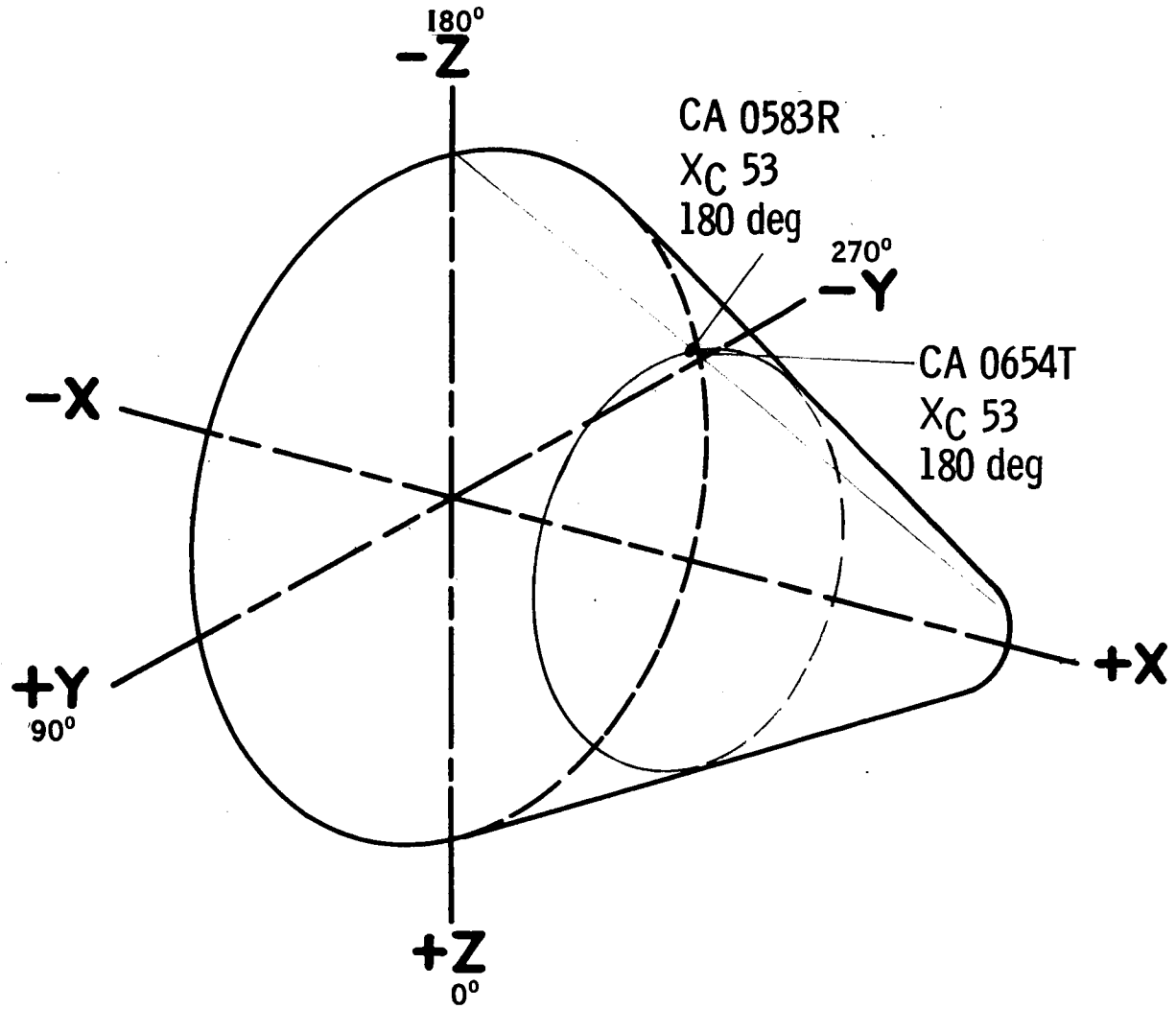
CONFIDENTIAL





CONFIDENTIAL

5/30/64 605

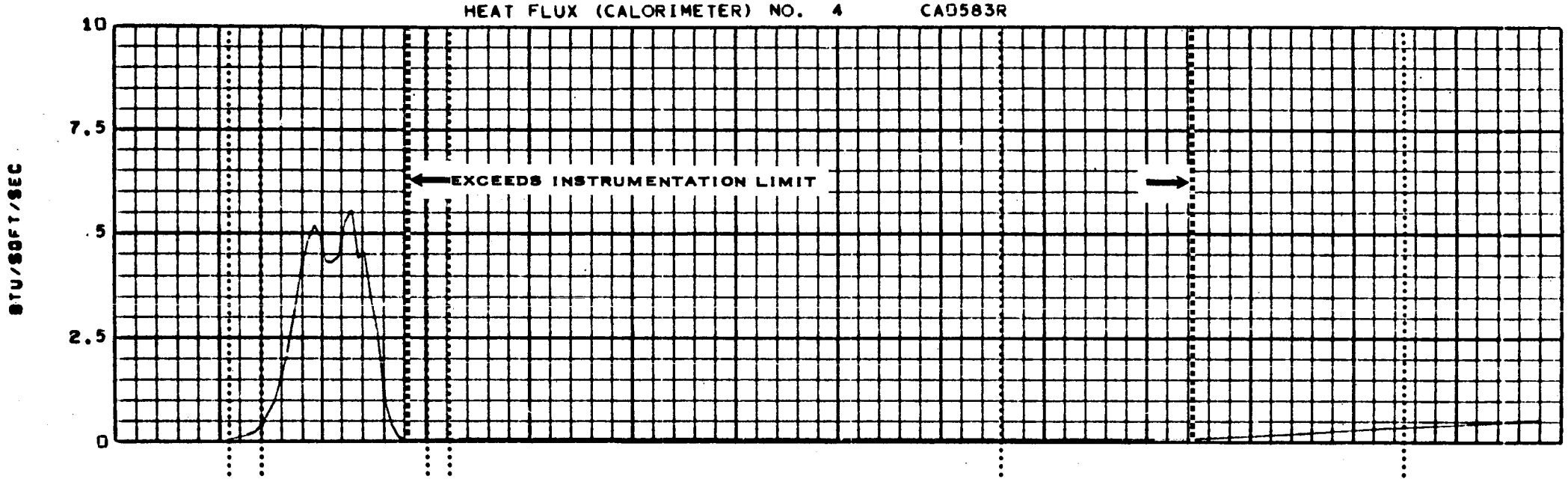

180°
-Z
CA 0583R
X_C 53
180 deg
270°
-Y
CA 0654T
X_C 53
180 deg
-X
+X
+Y
90°
+Z
0°

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

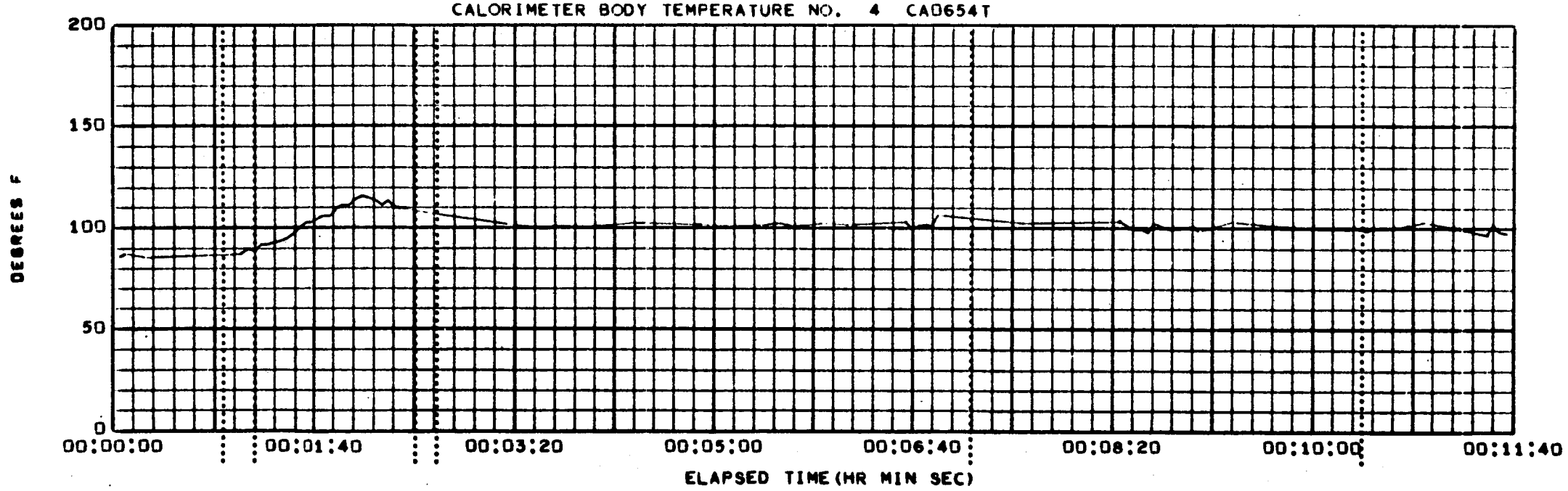
APOLLO BP-13

~~CONFIDENTIAL~~

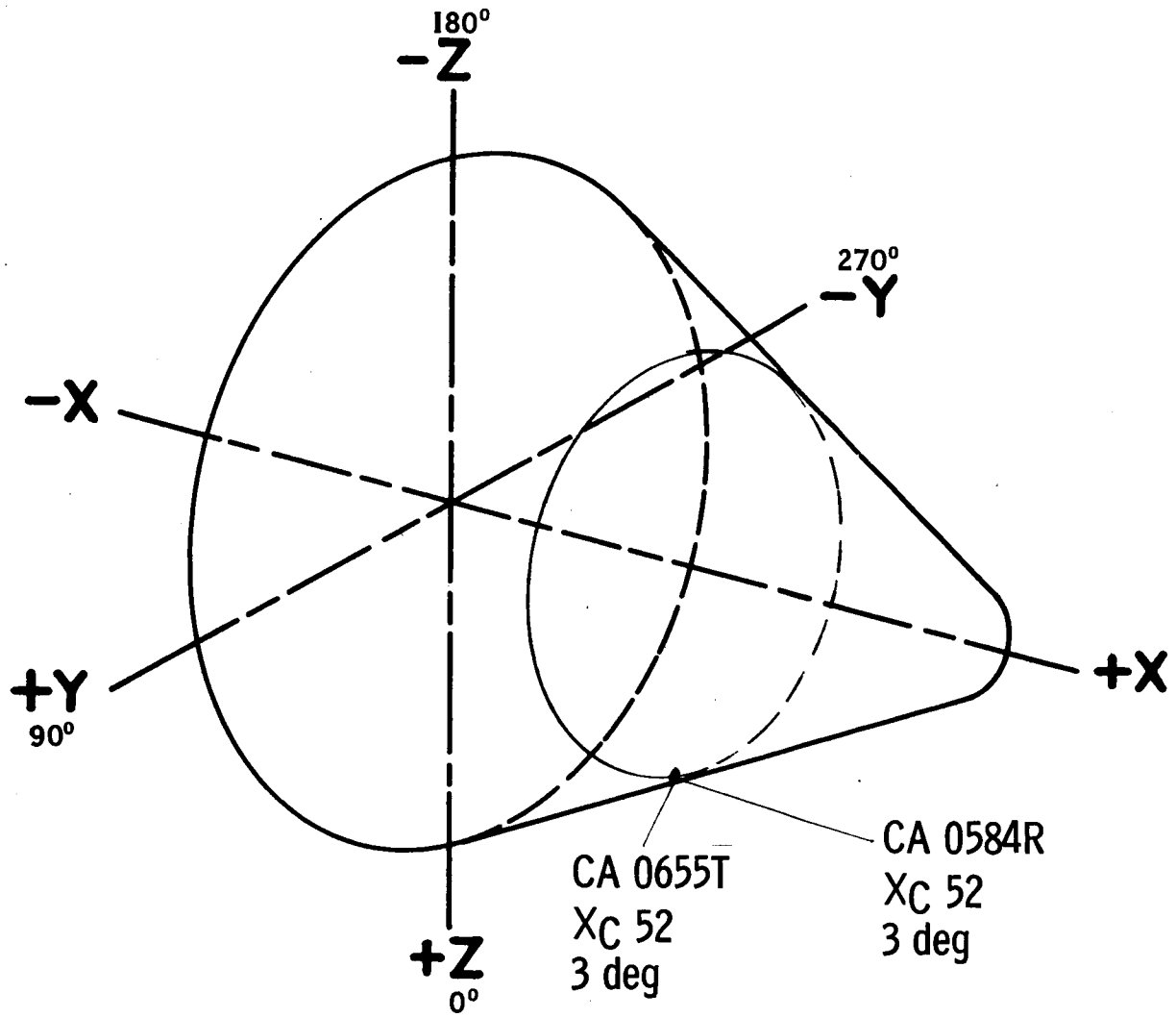
HEAT FLUX (CALORIMETER) NO. 4 CA0583R



CALORIMETER BODY TEMPERATURE NO. 4 CA0654T



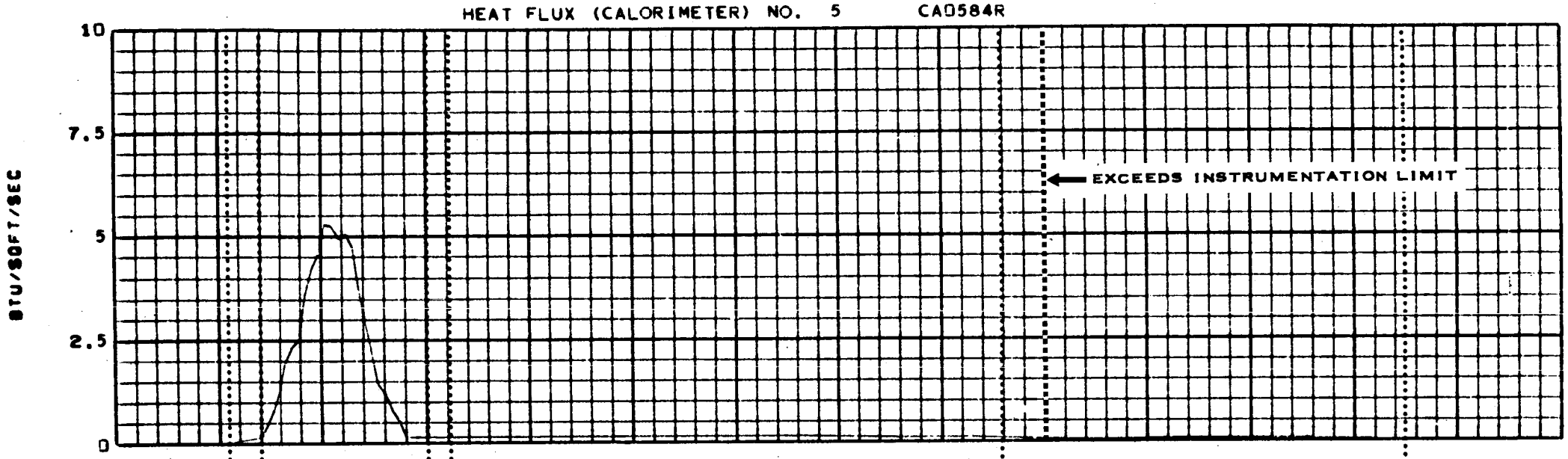
~~CONFIDENTIAL~~


180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°
CA 0655T
XC 52
3 deg
CA 0584R
XC 52
3 deg

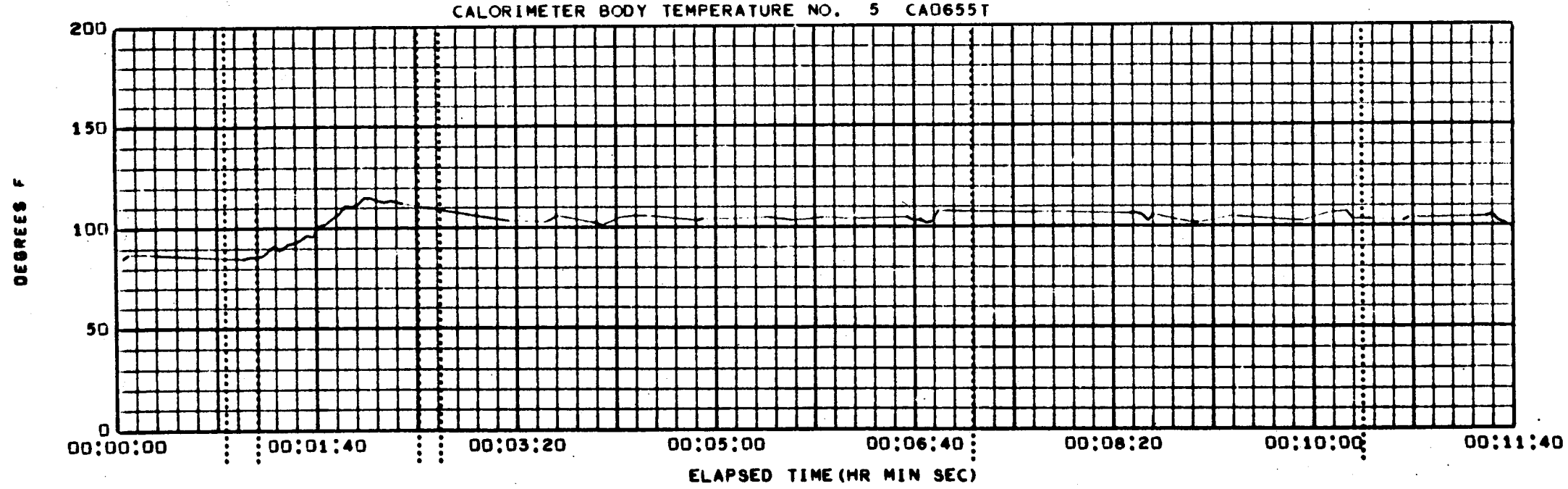
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

CONFIDENTIAL

HEAT FLUX (CALORIMETER) NO. 5 CA0584R



CALORIMETER BODY TEMPERATURE NO. 5 CA0655T



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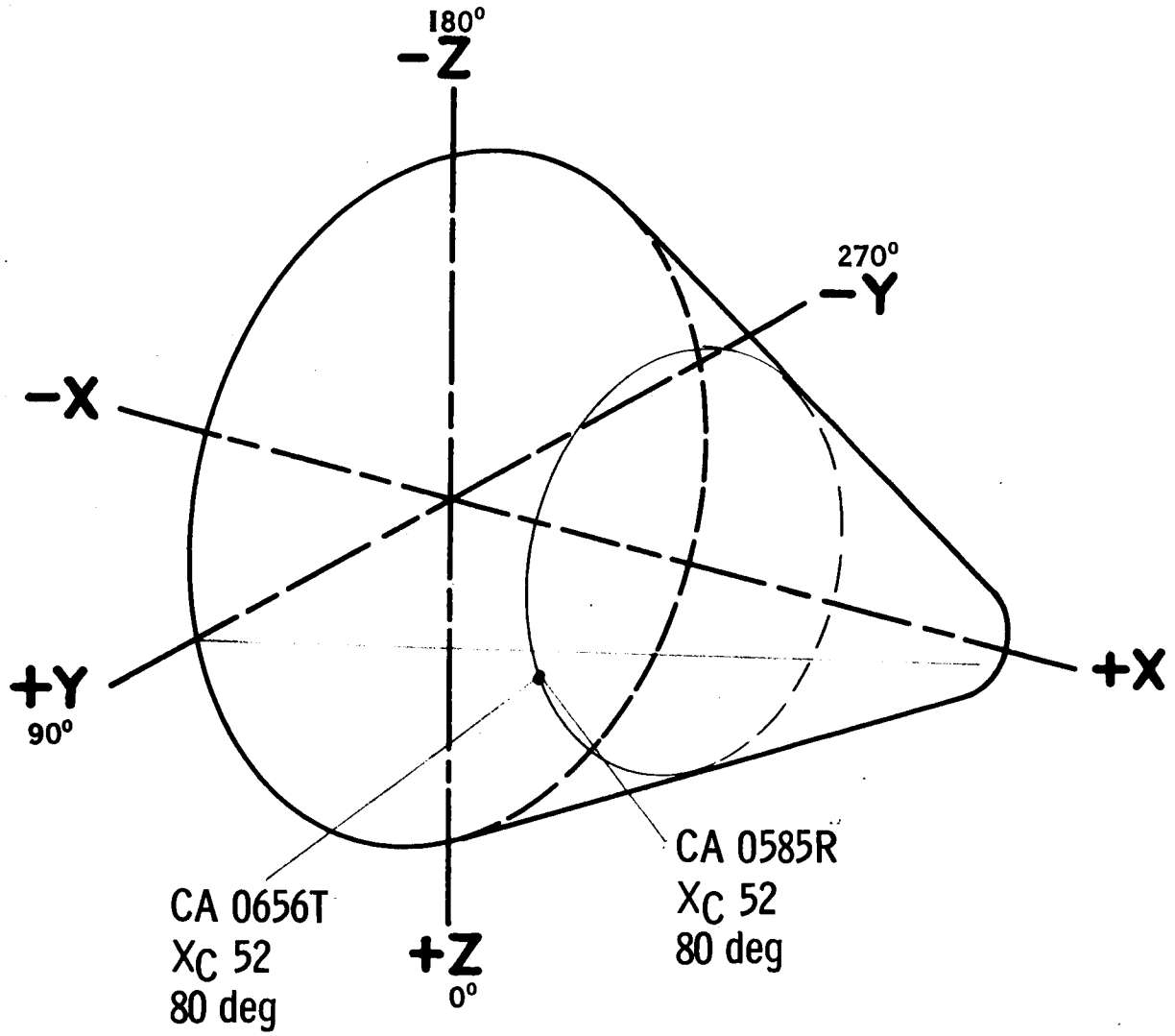
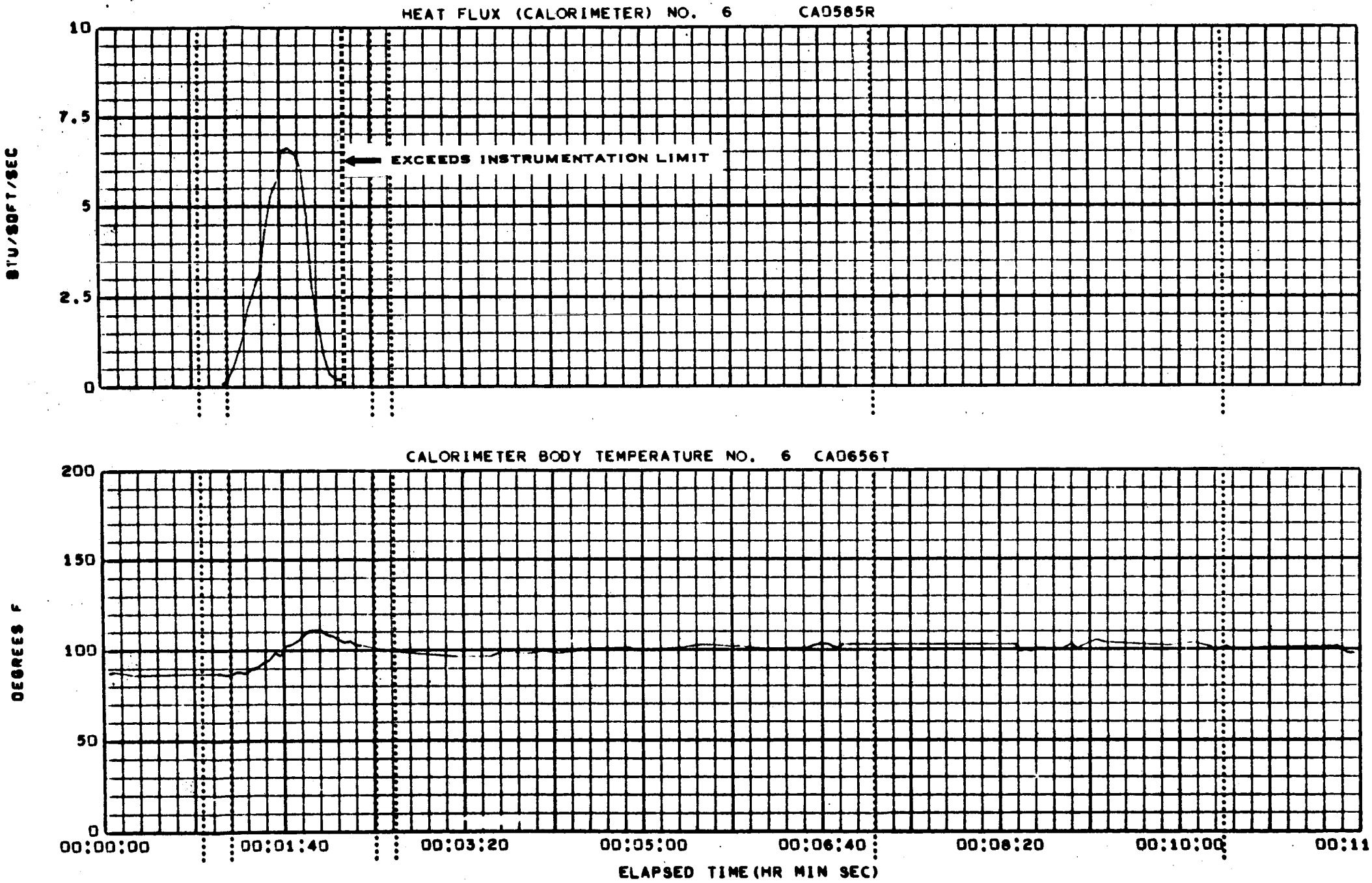

180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°
CA 0656T
XC 52
80 deg
CA 0585R
XC 52
80 deg

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

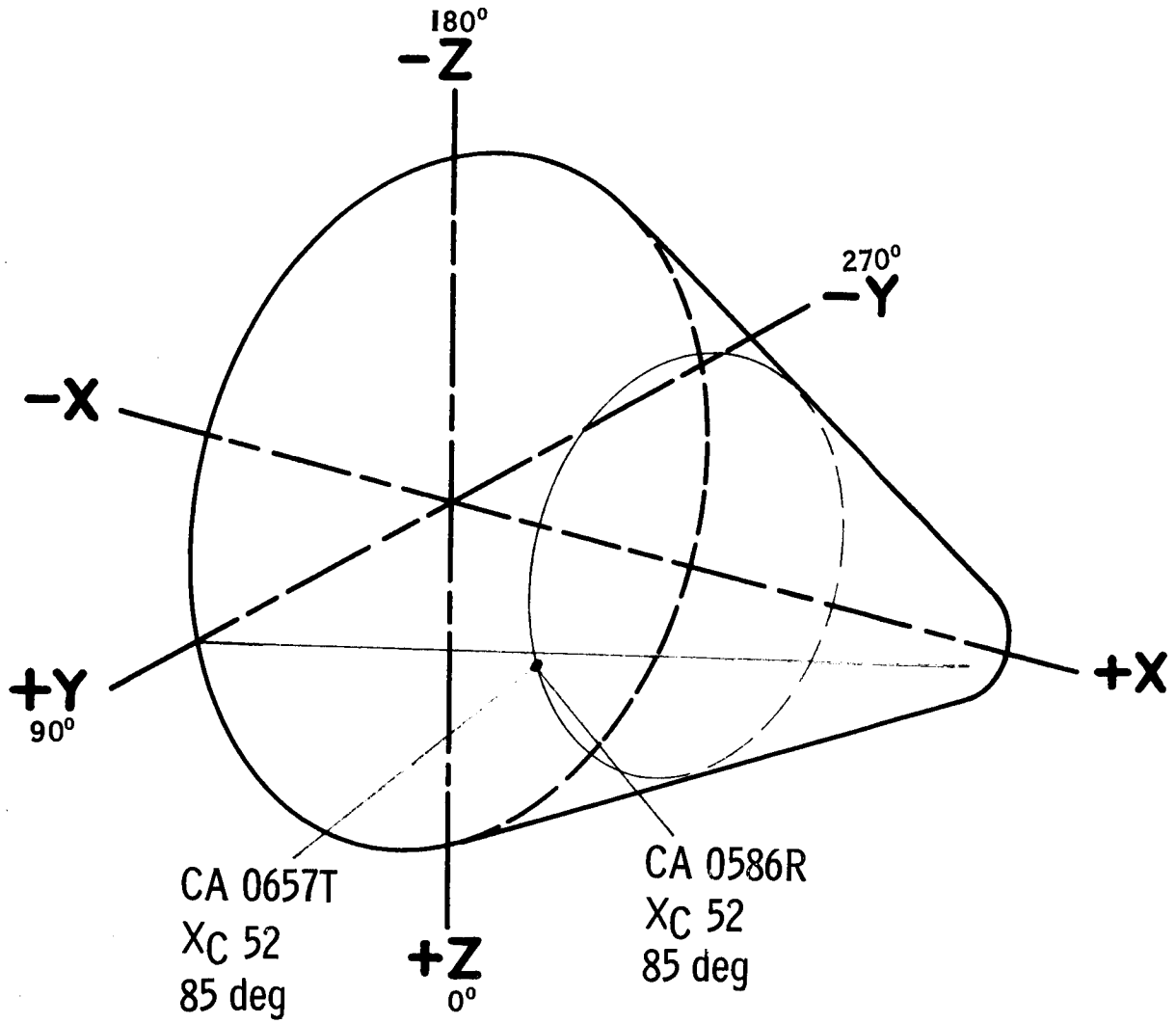
APOLLO BP-13

~~CONFIDENTIAL~~



~~CONFIDENTIAL~~

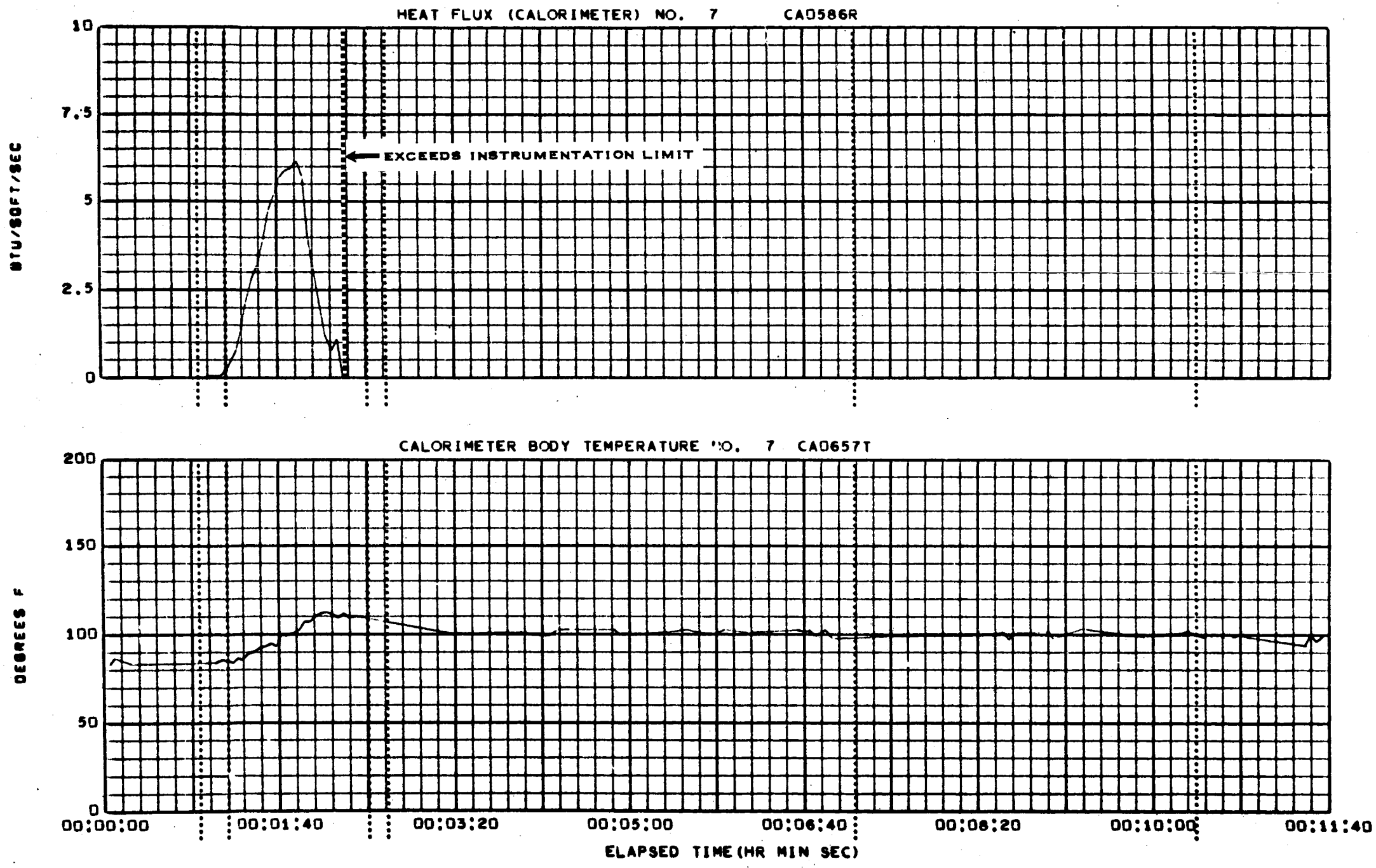
5/30/64 611


180°
-Z
270°
-Y
-X
+X
+Y
90°
+Z
0°
CA 0657T
Xc 52
85 deg
CA 0586R
Xc 52
85 deg

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

~~CONFIDENTIAL~~



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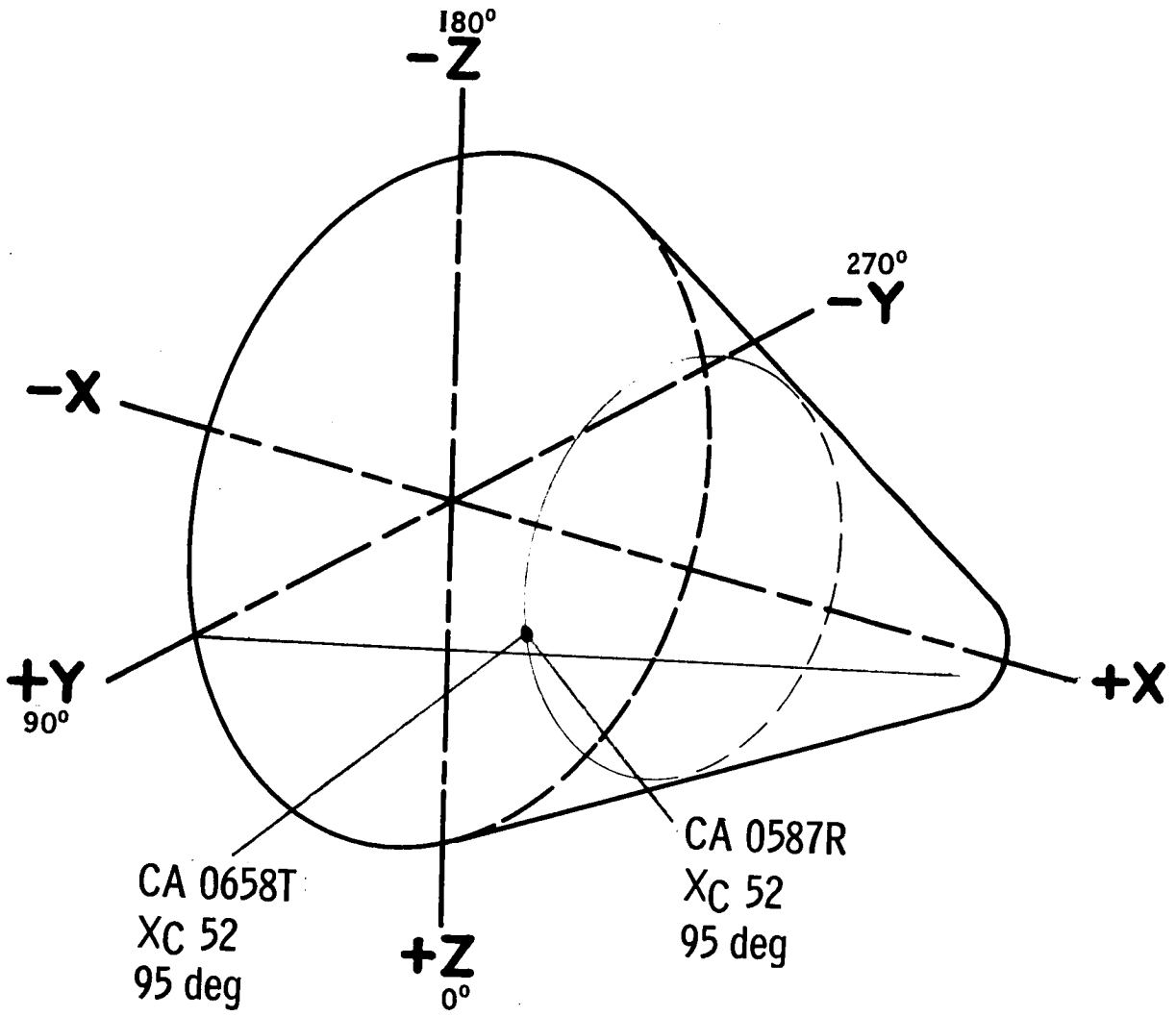
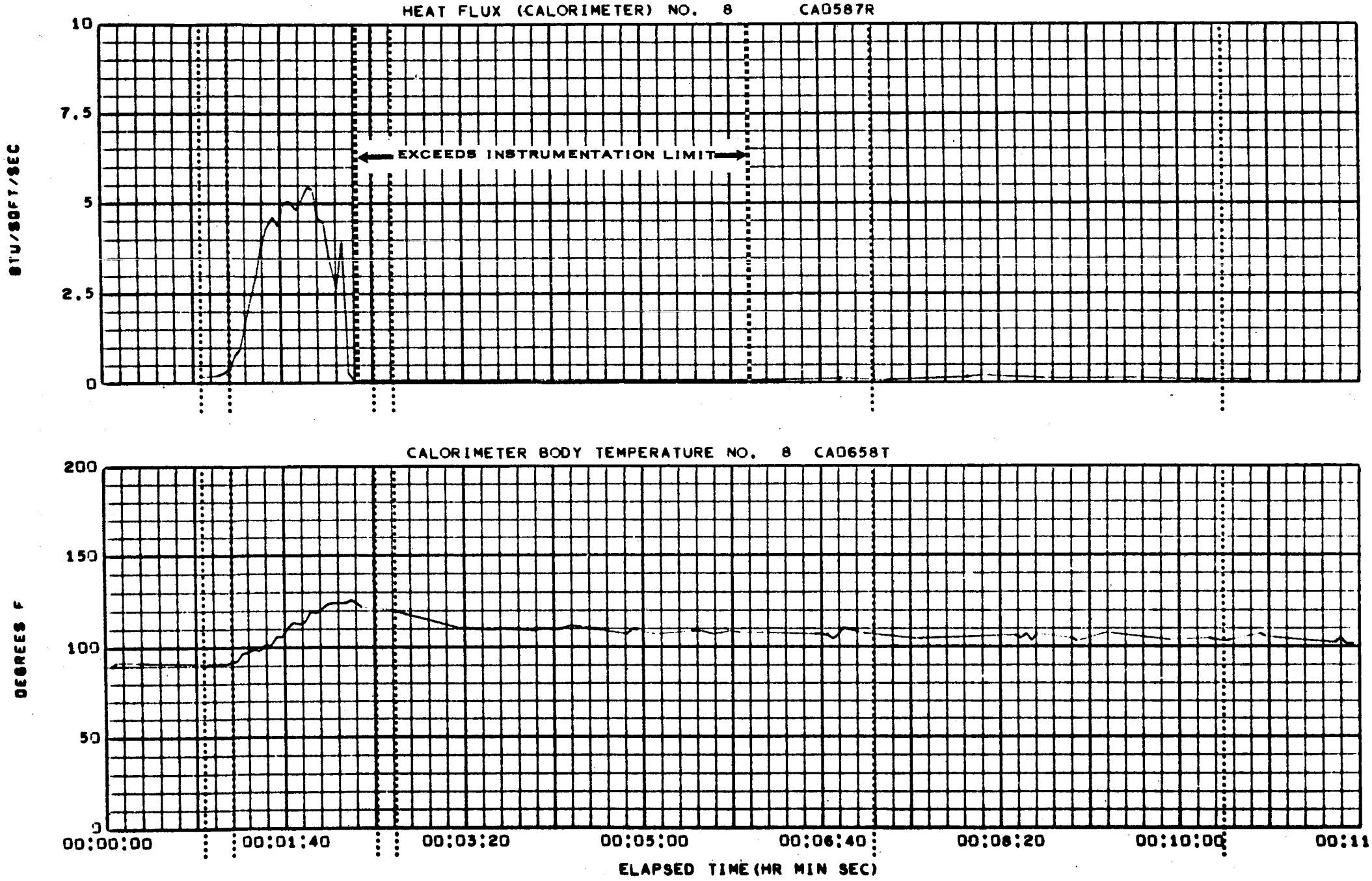

180°
-Z
270°
-Y
-X
+Y
90°
+X
CA 0658T
XC 52
95 deg
+Z
0°
CA 0587R
XC 52
95 deg

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

~~CONFIDENTIAL~~



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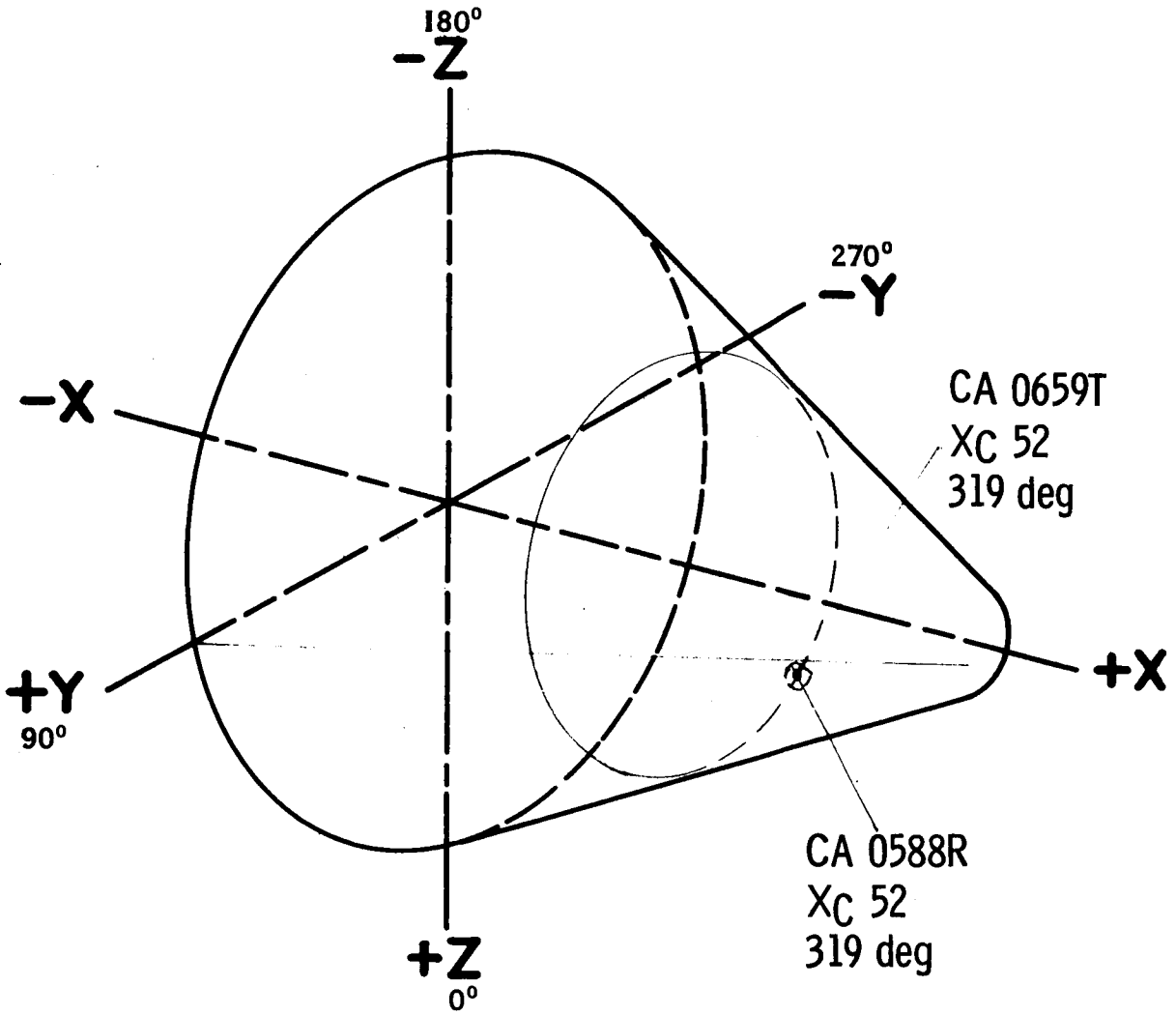
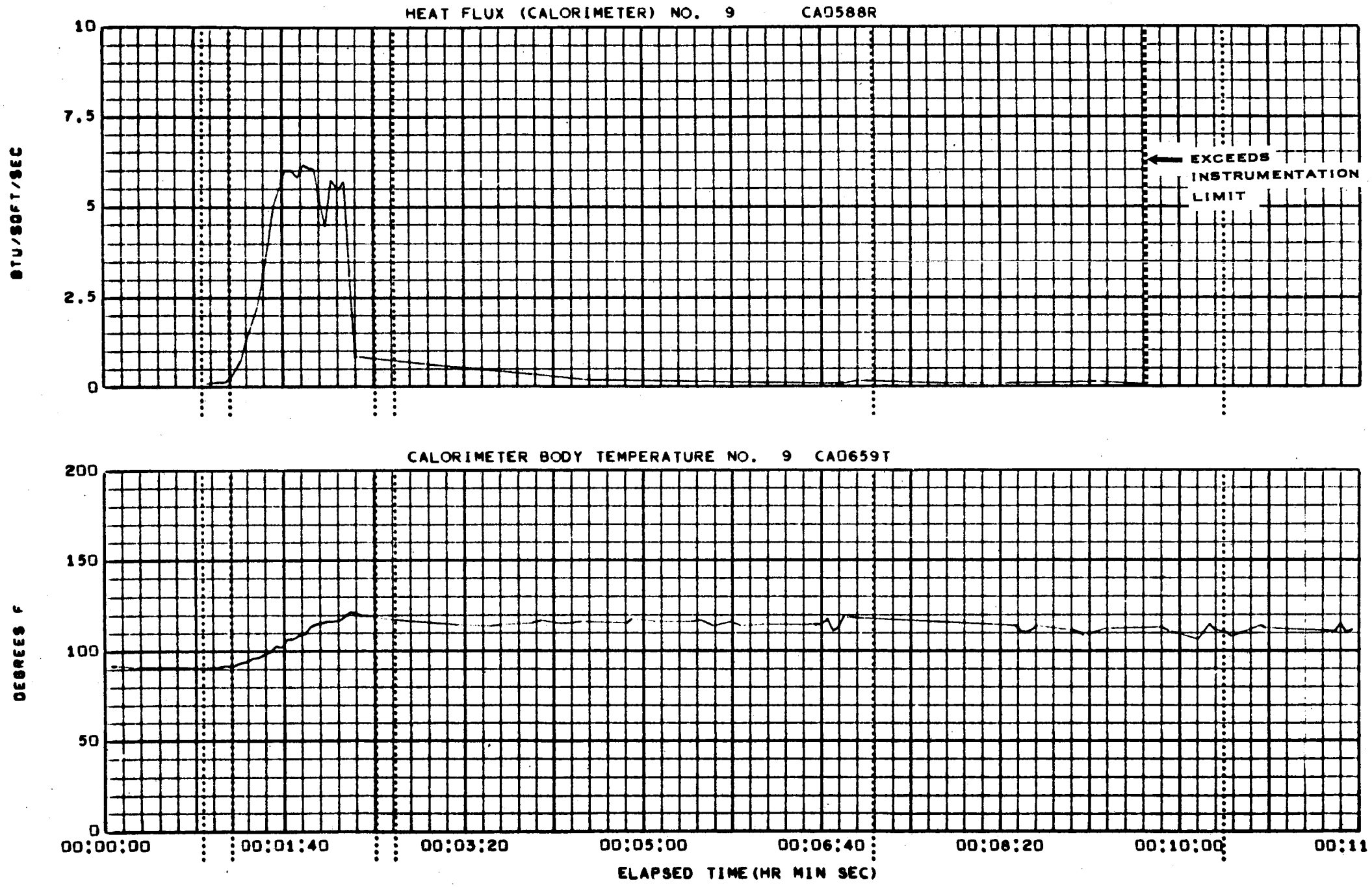
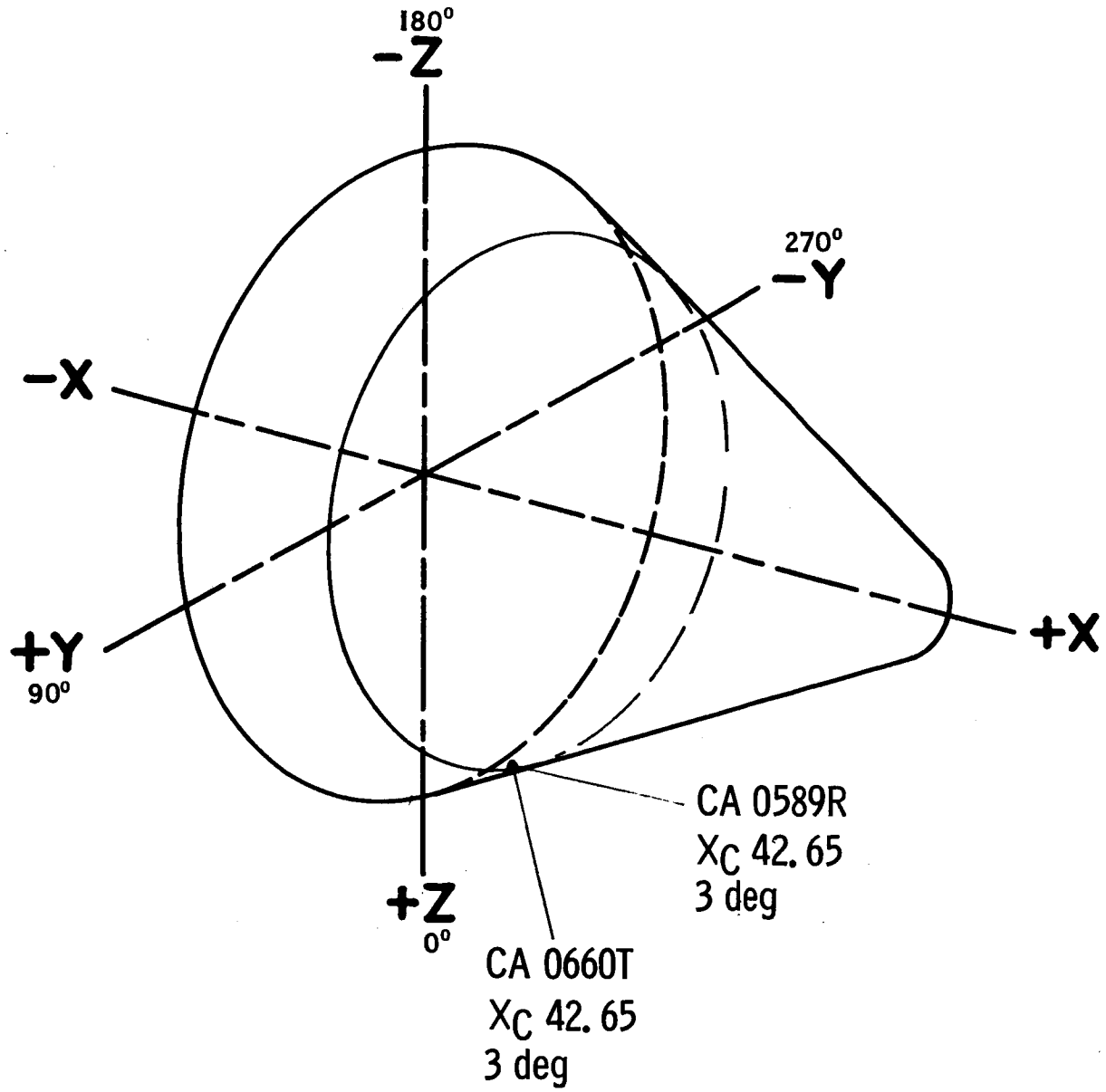

180°
-Z
270°
-Y
-X
CA 0659T
Xc 52
319 deg
+Y
90°
+X
CA 0588R
Xc 52
319 deg
+Z
0°

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

CONFIDENTIAL

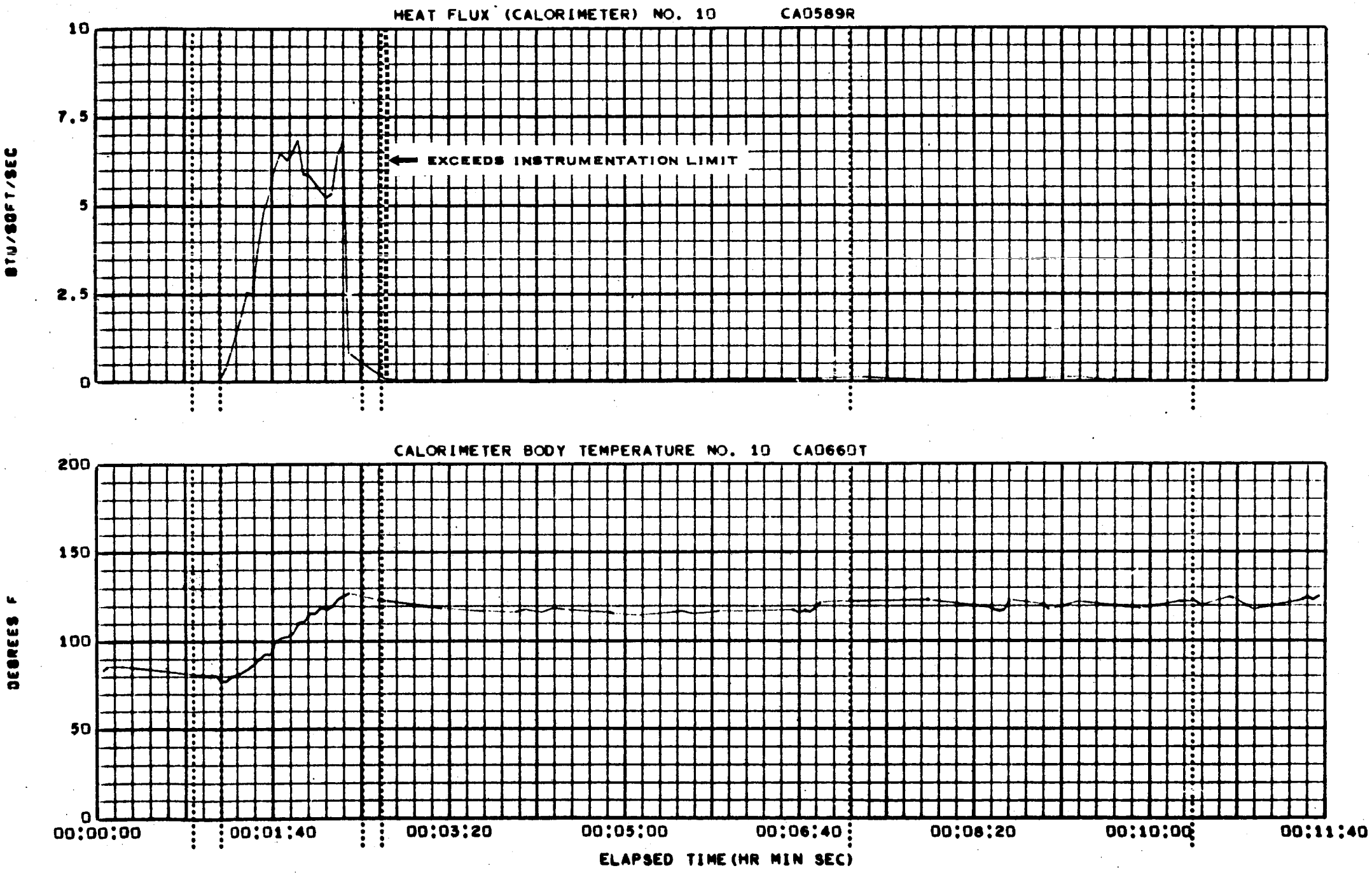


CONFIDENTIAL

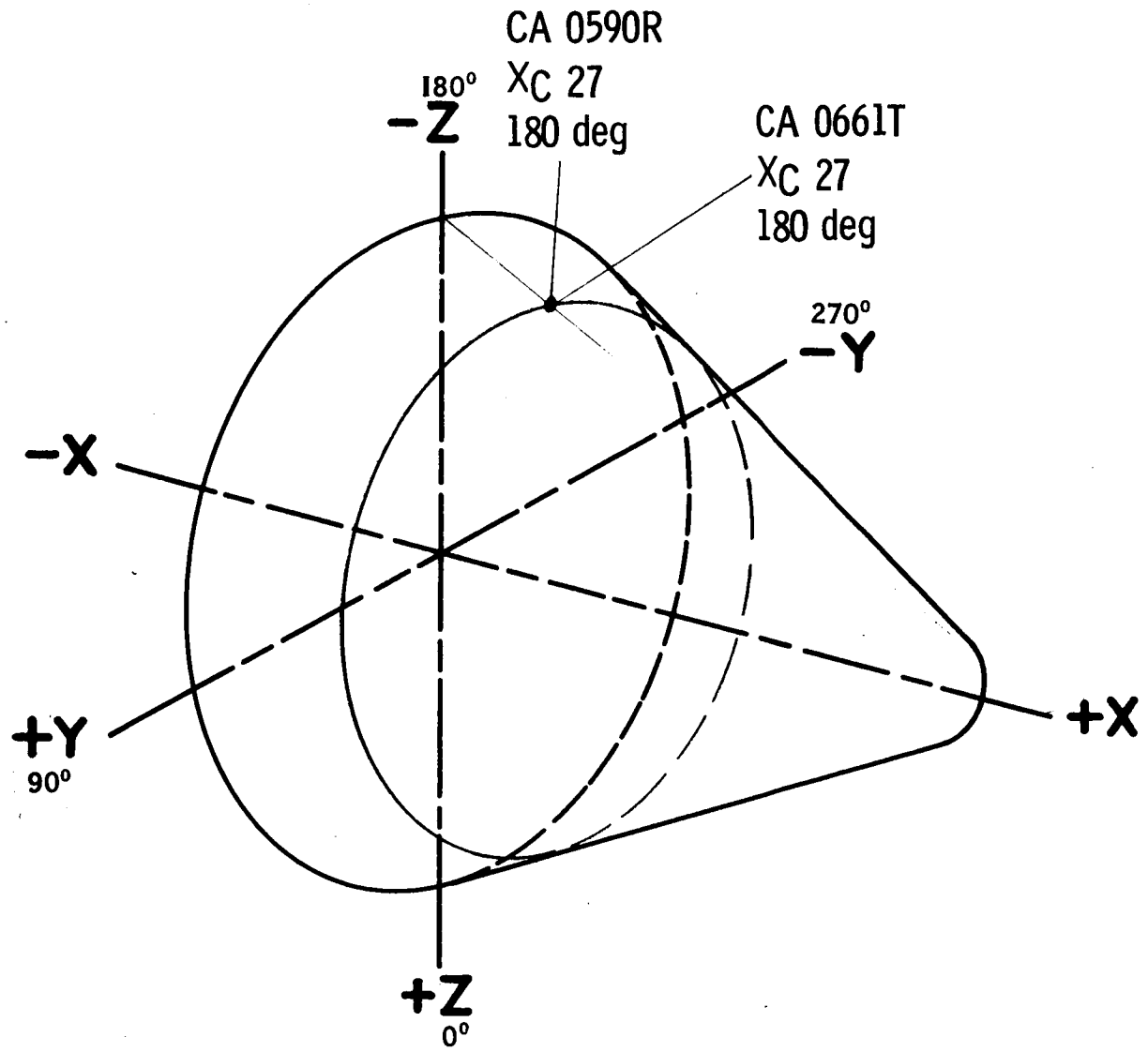

180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°
CA 0589R
X_C 42.65
3 deg
CA 0660T
X_C 42.65
3 deg

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

CONFIDENTIAL



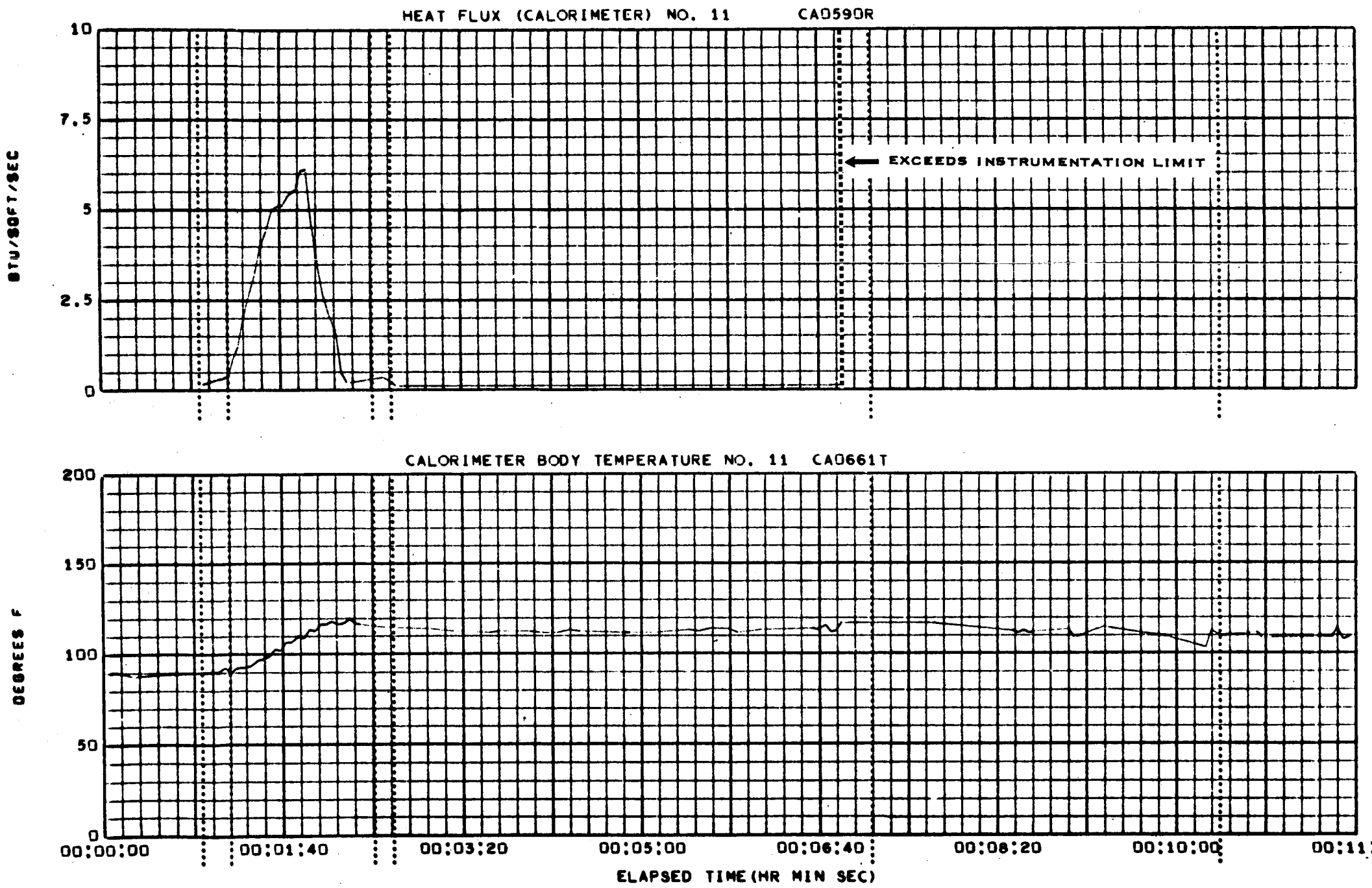
CONFIDENTIAL


CA 0590R
X_C 27
180 deg
CA 0661T
X_C 27
180 deg
180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

~~CONFIDENTIAL~~



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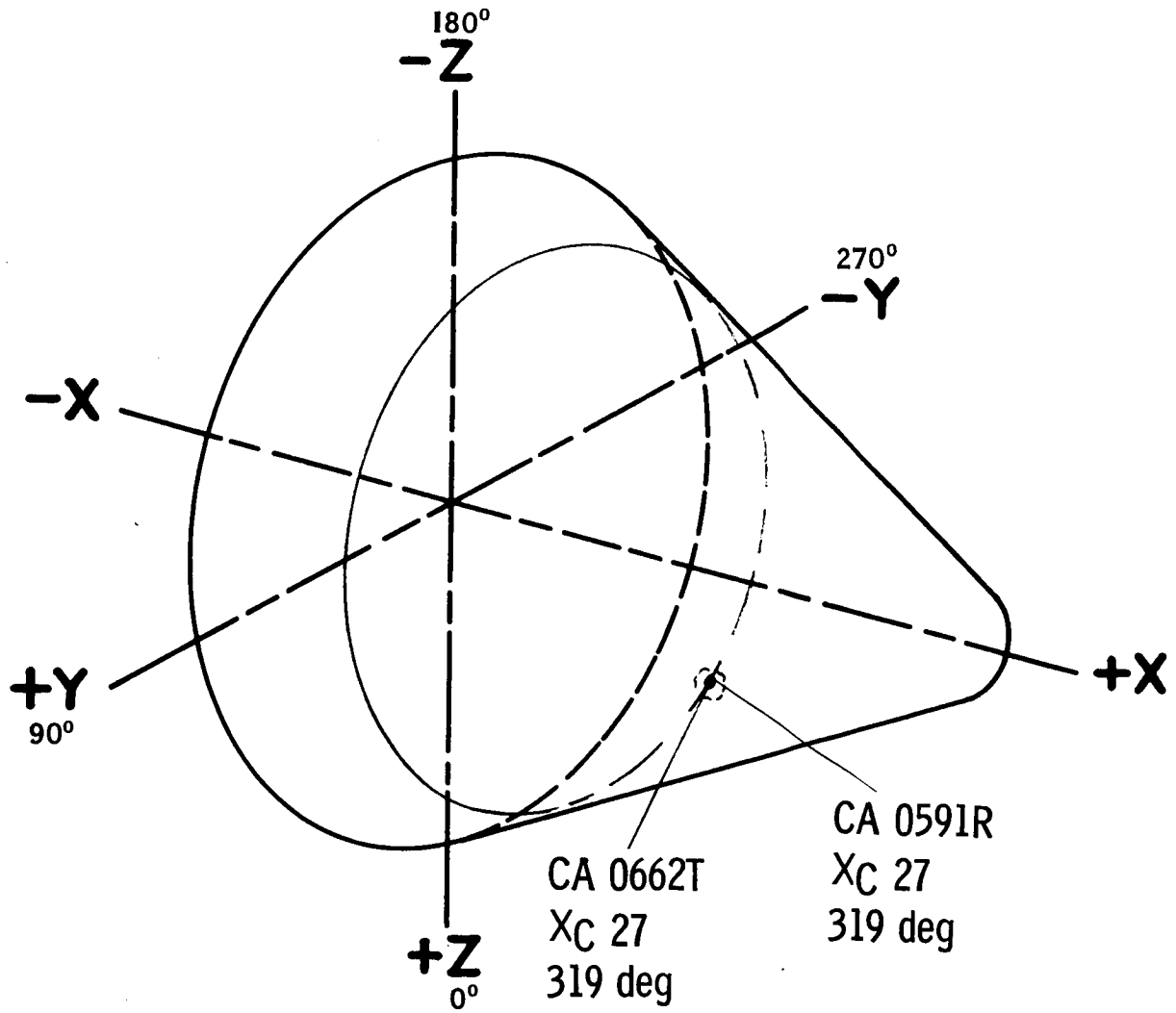
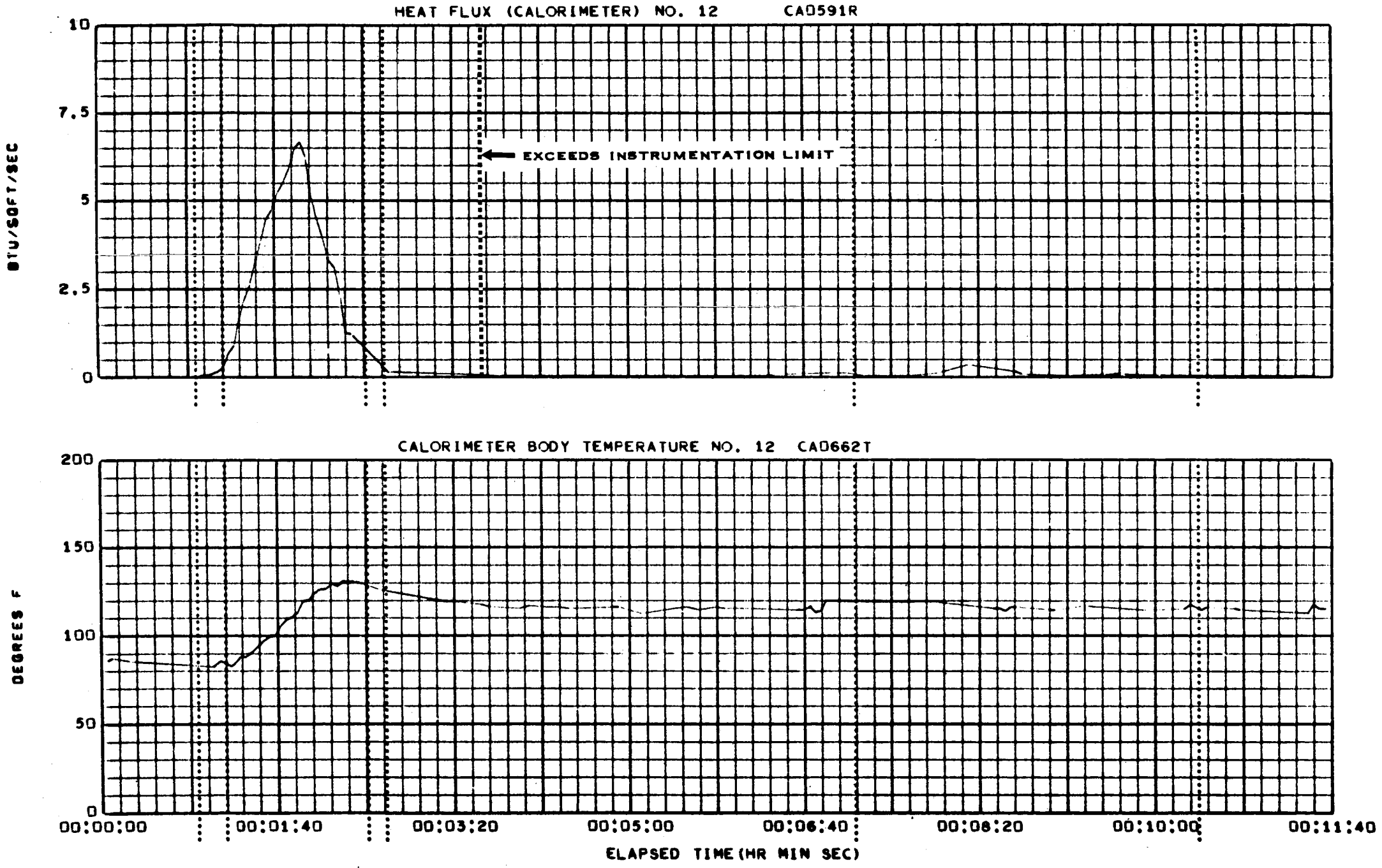

180°
-Z
270°
-Y
-X
+Y
90°
+X
+Z
0°
CA 0662T
XC 27
319 deg
CA 0591R
XC 27
319 deg

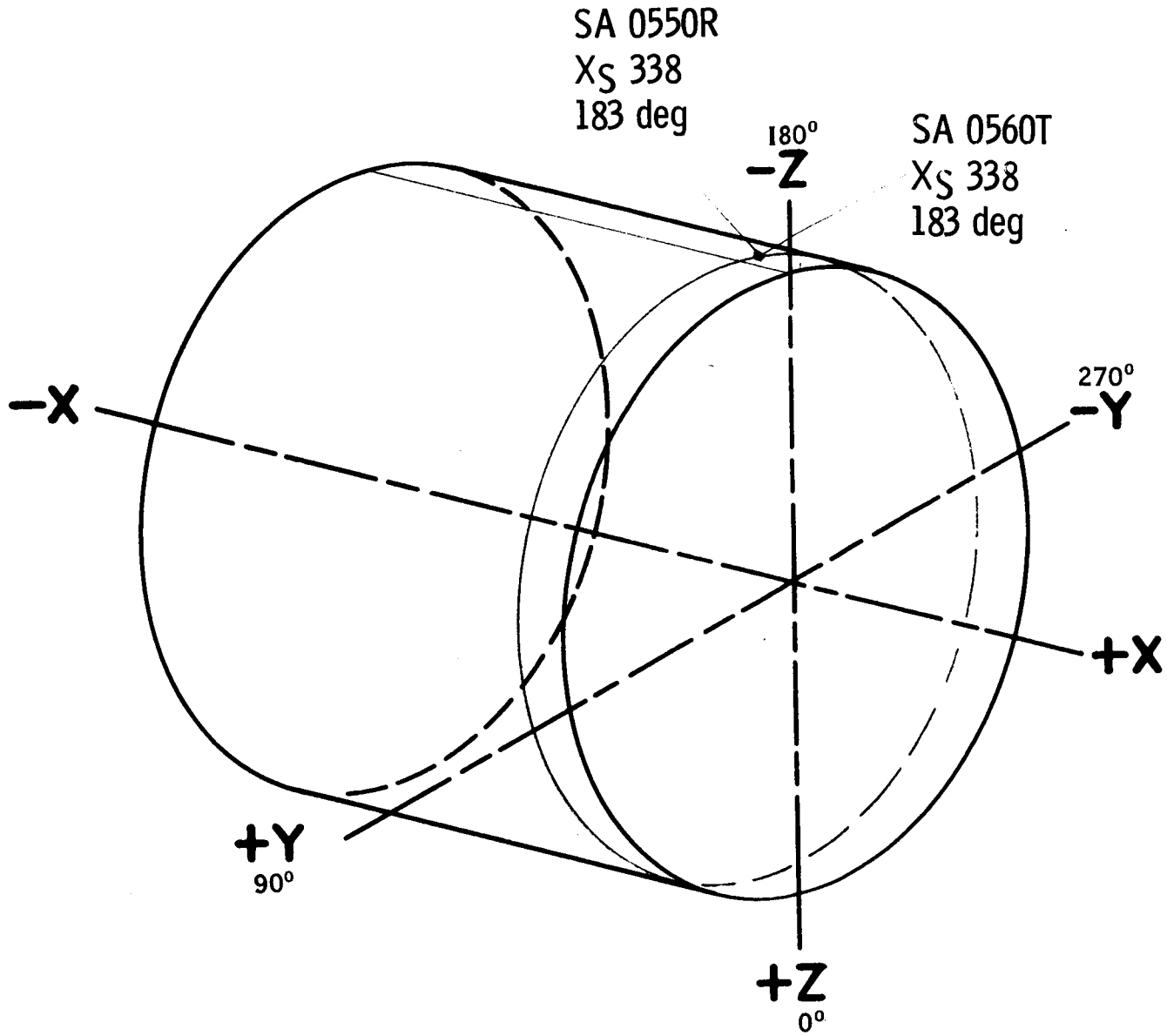
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

APOLLO BP-13

~~CONFIDENTIAL~~



~~CONFIDENTIAL~~

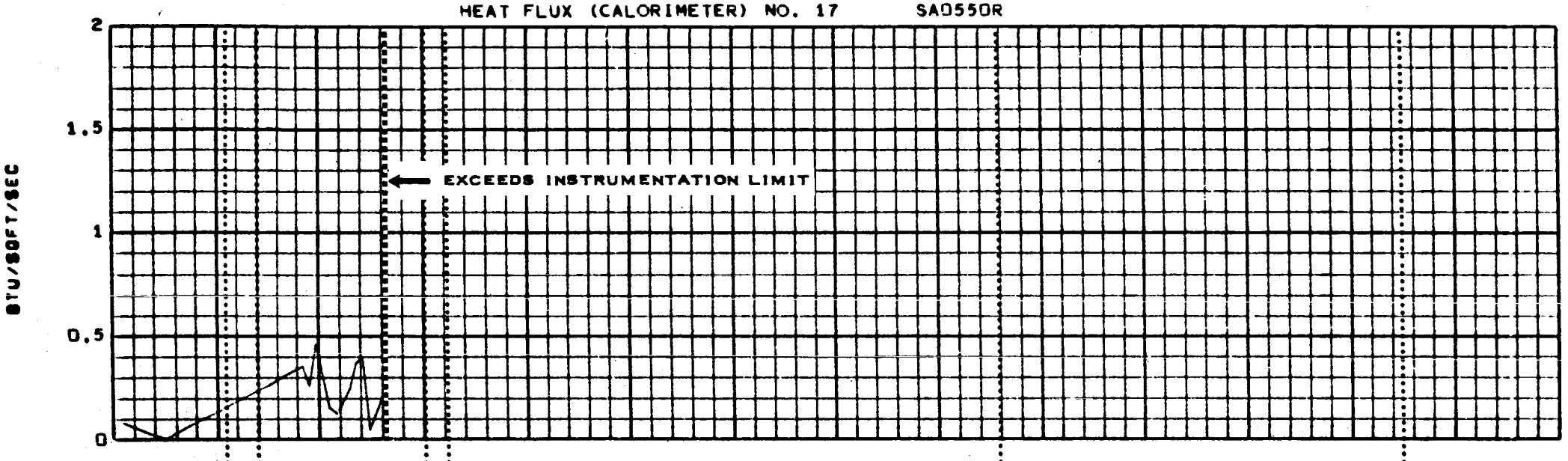

SA 0550R
X_S 338
183 deg
180°
-Z
SA 0560T
X_S 338
183 deg
-X
270°
-Y
+X
+Y
90°
+Z
0°

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

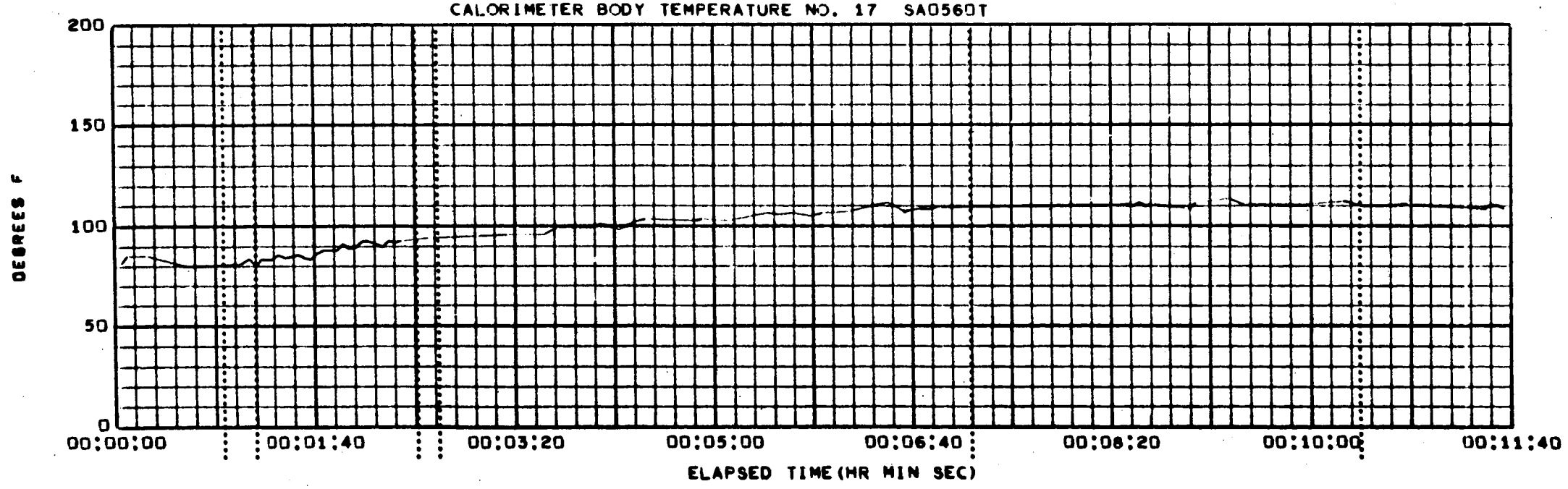
APOLLO BP-13

~~CONFIDENTIAL~~

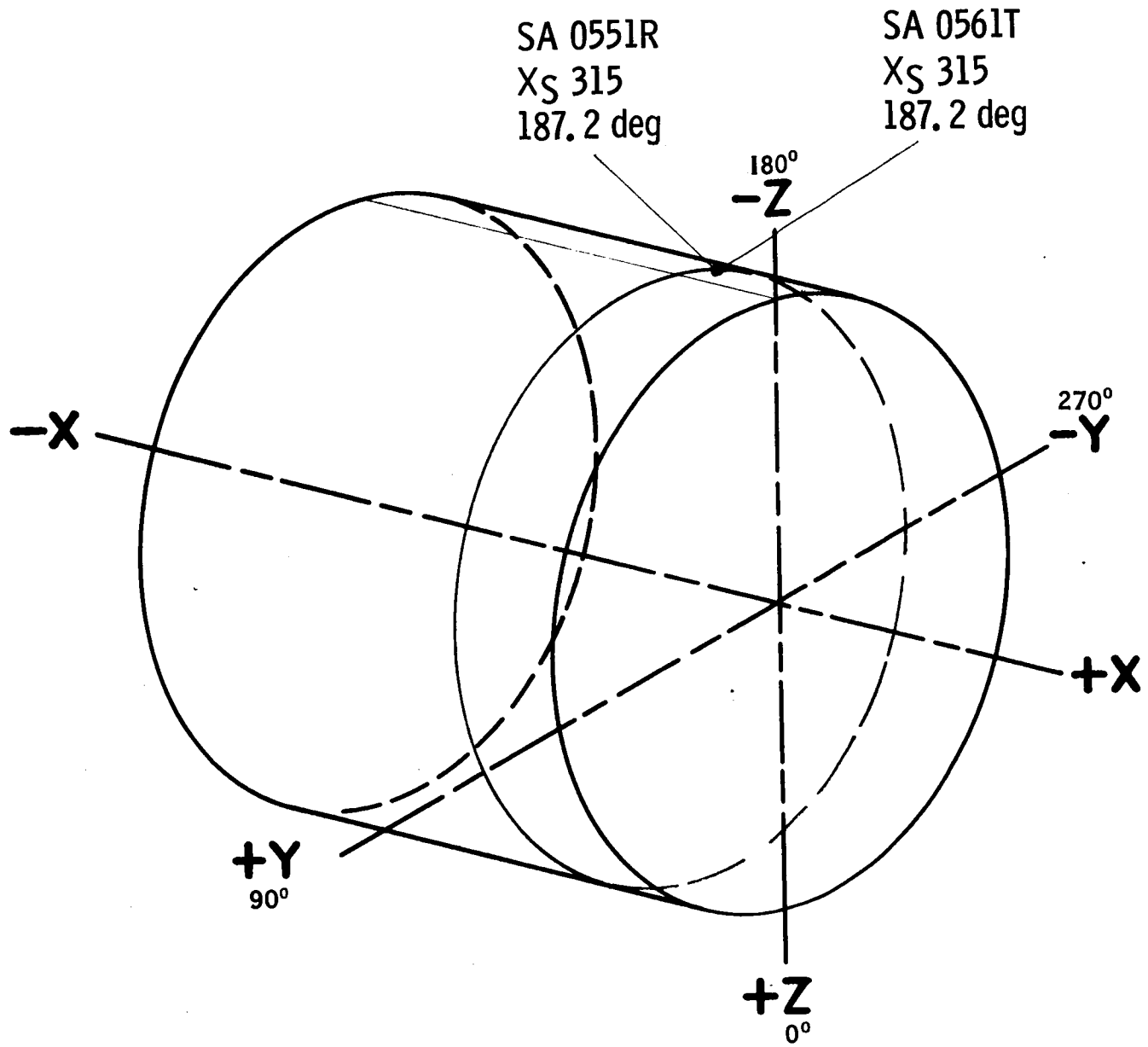
HEAT FLUX (CALORIMETER) NO. 17 SA055OR



CALORIMETER BODY TEMPERATURE NO. 17 SA056OT



~~CONFIDENTIAL~~

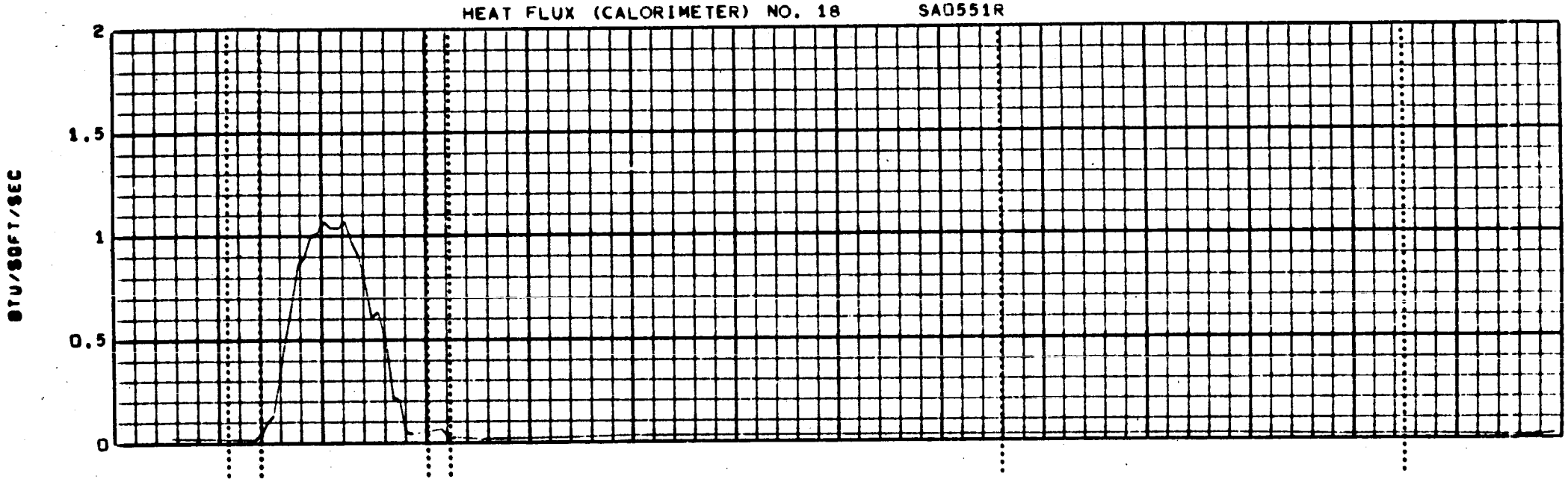

SA 0551R
XS 315
187.2 deg
SA 0561T
XS 315
187.2 deg
180°
-Z
-X
270°
-Y
+X
+Y
90°
+Z
0°

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

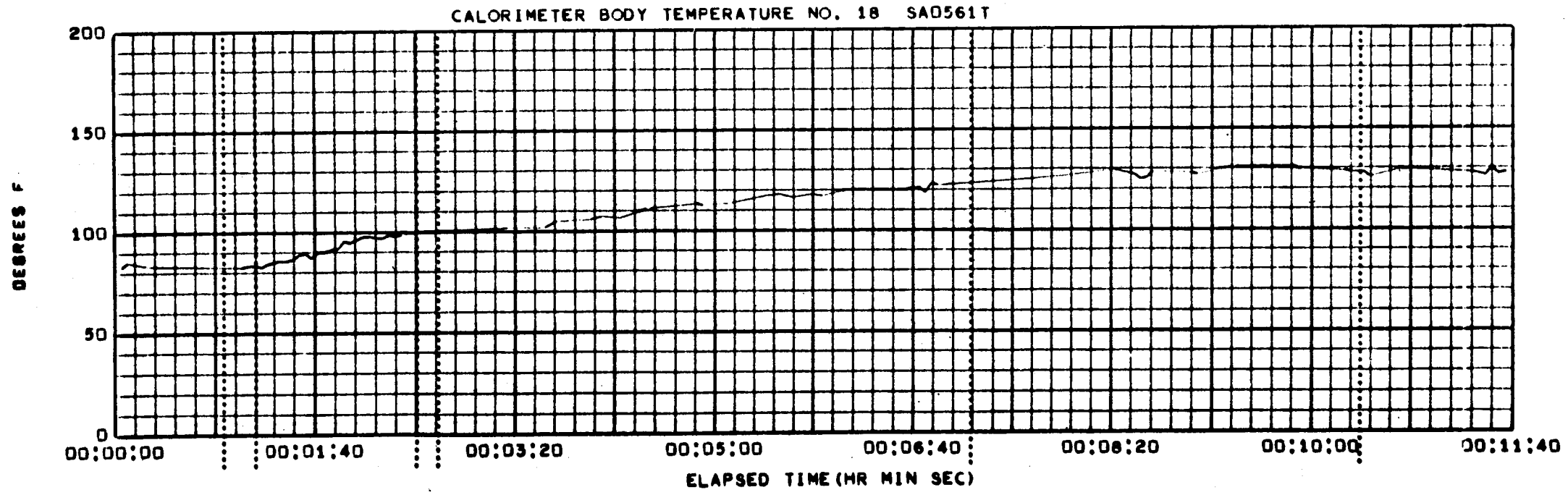
APOLLO BP-13

~~CONFIDENTIAL~~

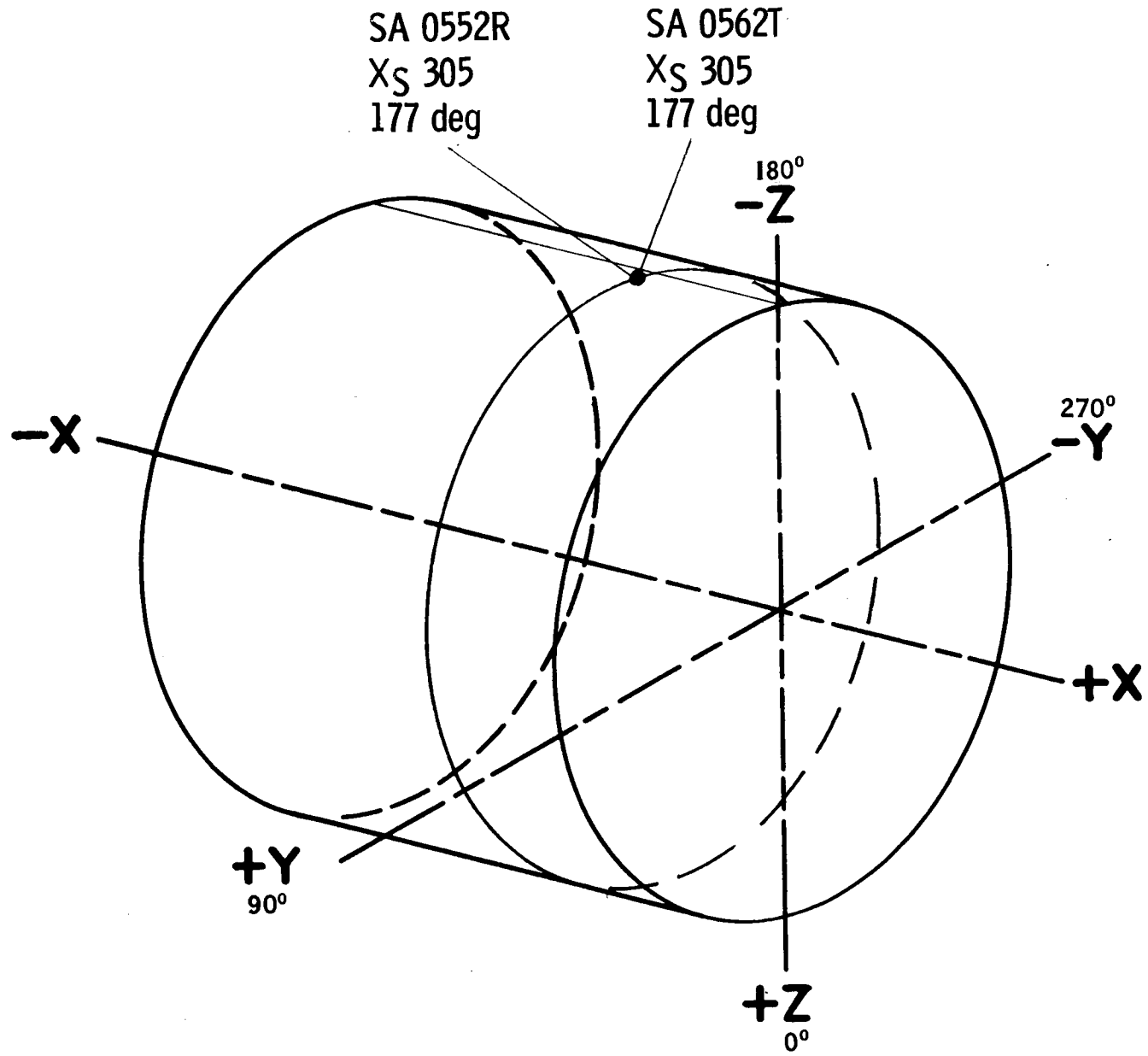
HEAT FLUX (CALORIMETER) NO. 18 SA0551R



CALORIMETER BODY TEMPERATURE NO. 18 SA0561T



~~CONFIDENTIAL~~

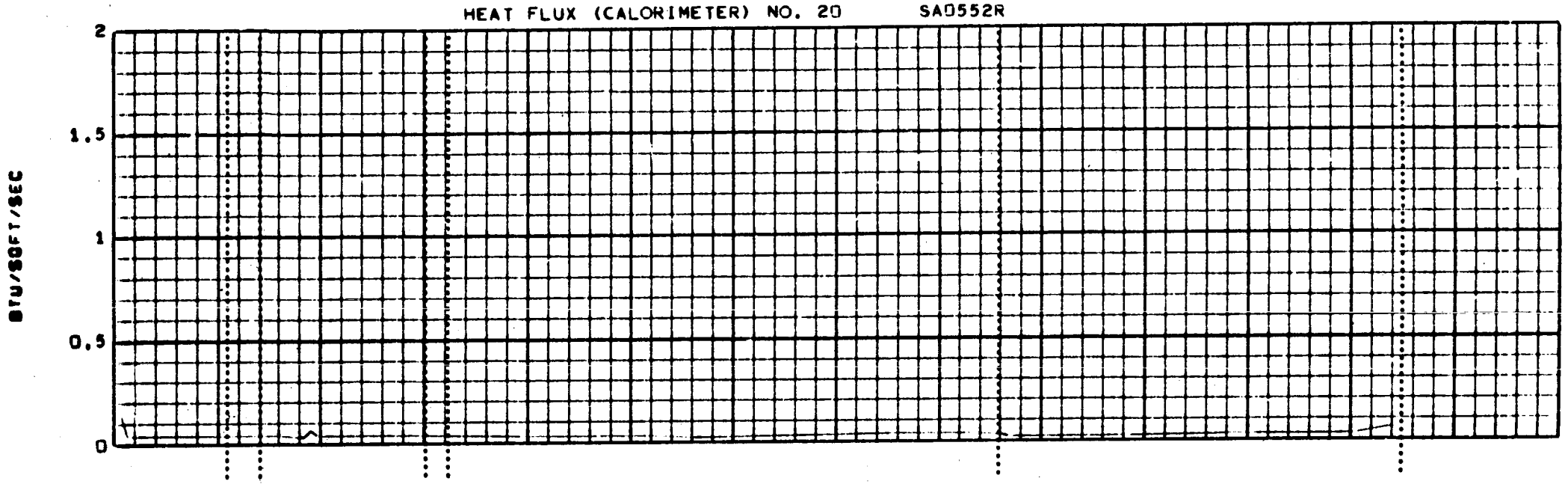

SA 0552R
Xs 305
177 deg
SA 0562T
Xs 305
177 deg
180°
-Z
-X
270°
-Y
+X
+Y
90°
+Z
0°

00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

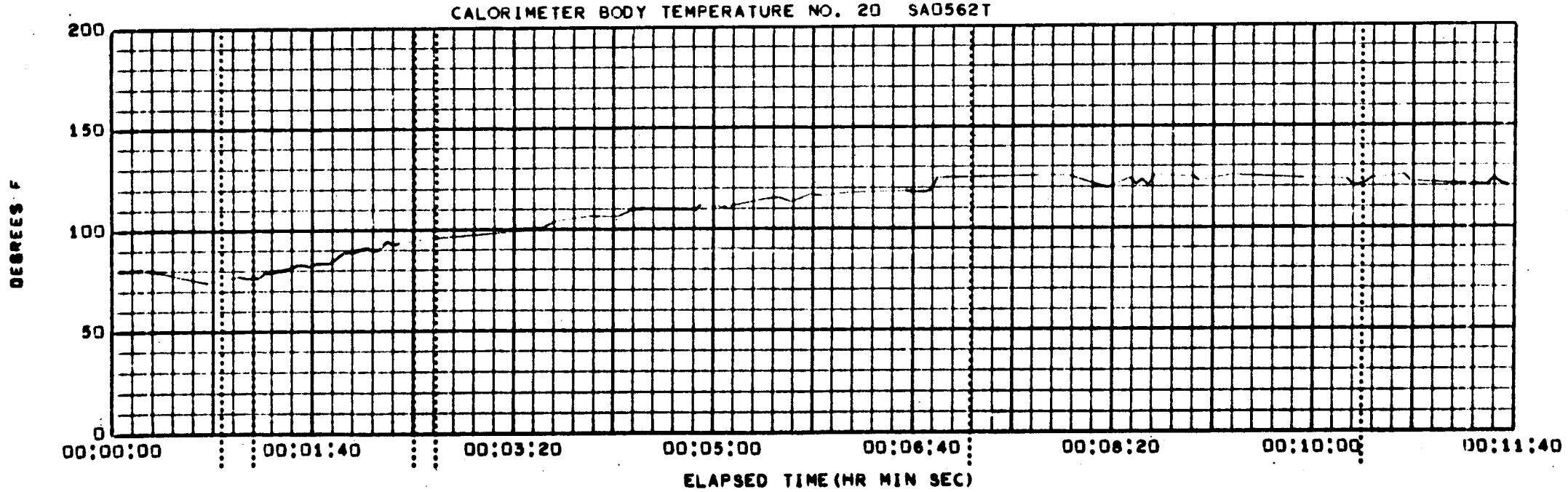
APOLLO BP-13

CONFIDENTIAL

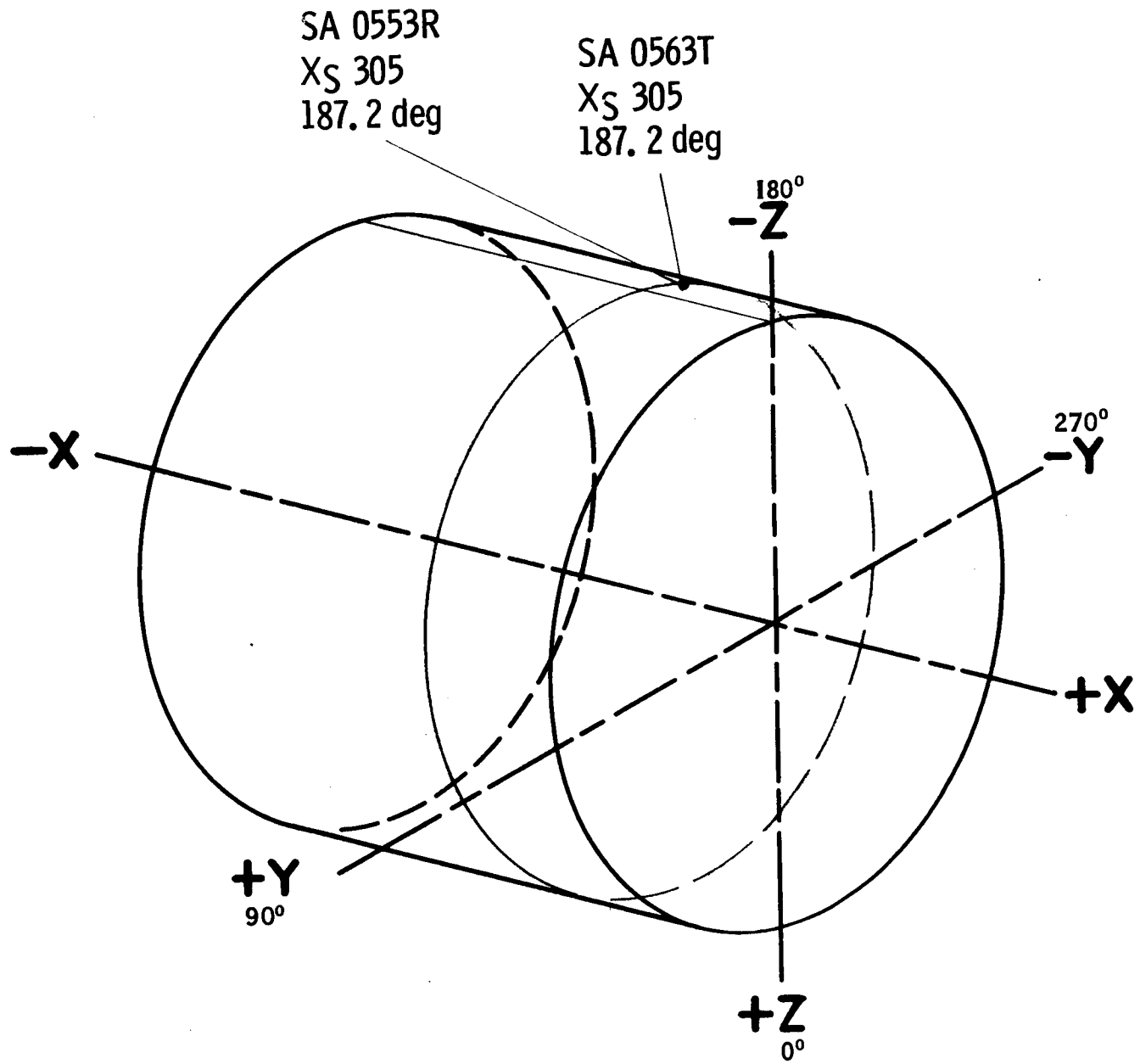
HEAT FLUX (CALORIMETER) NO. 20 SA0552R



CALORIMETER BODY TEMPERATURE NO. 20 SA0562T



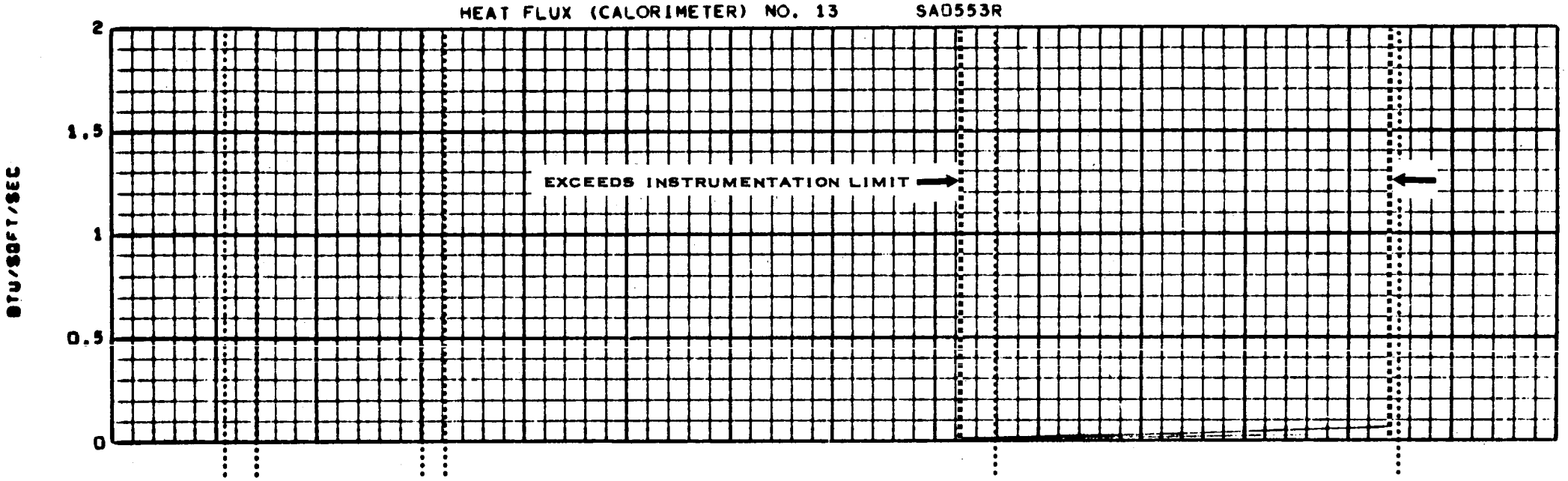
CONFIDENTIAL


SA 0553R
Xs 305
187.2 deg
SA 0563T
Xs 305
187.2 deg
180°
-Z
-X
270°
-Y
+X
+Y
90°
+Z
0°

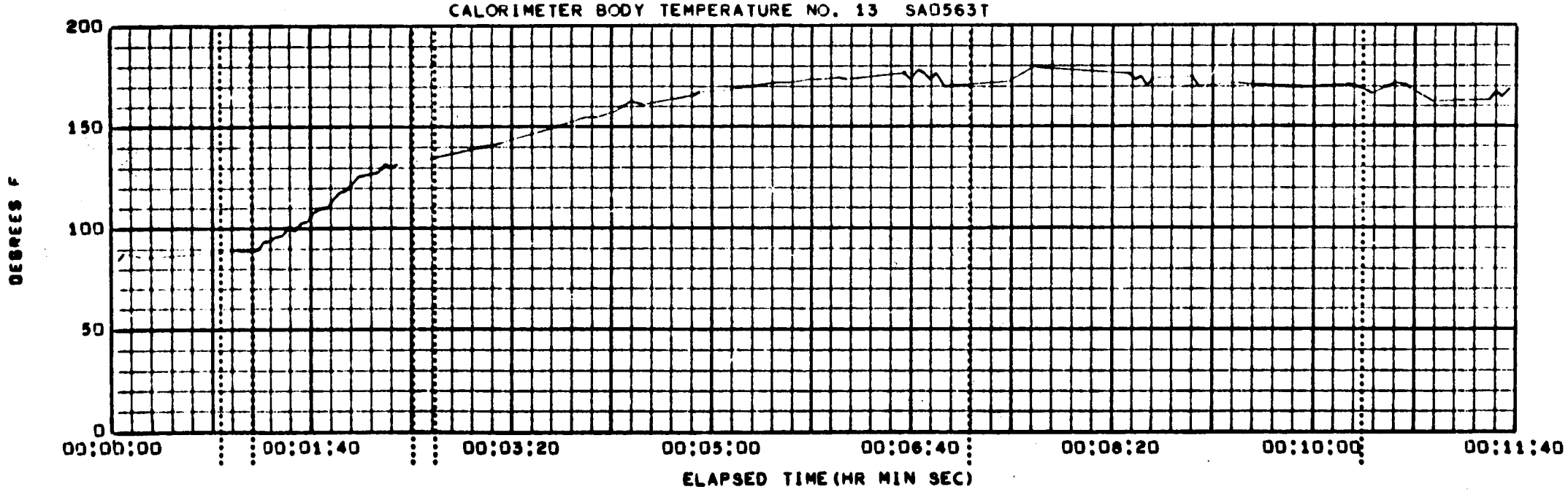
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

CONFIDENTIAL

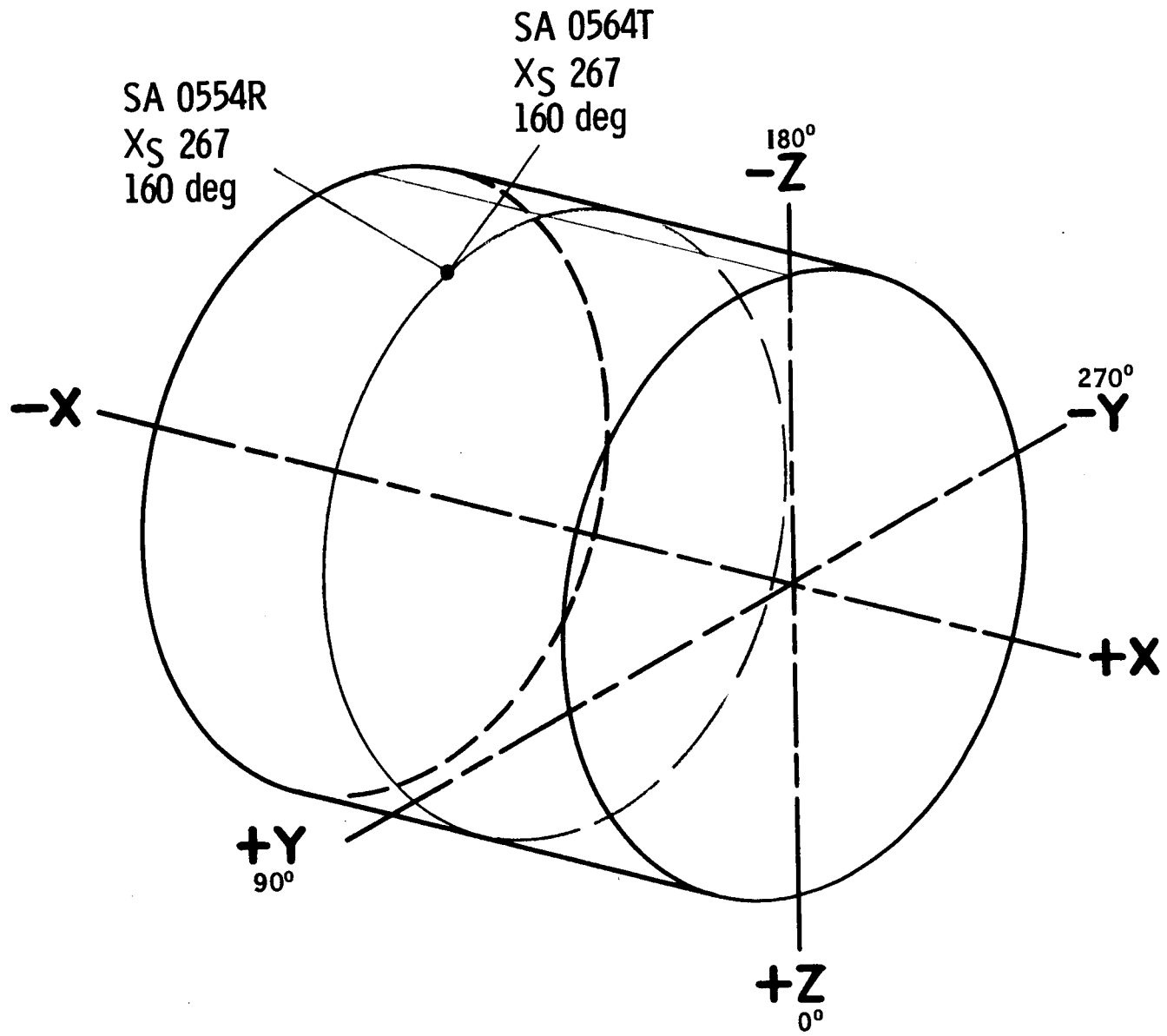
HEAT FLUX (CALORIMETER) NO. 13 SA0553R



CALORIMETER BODY TEMPERATURE NO. 13 SA0563T



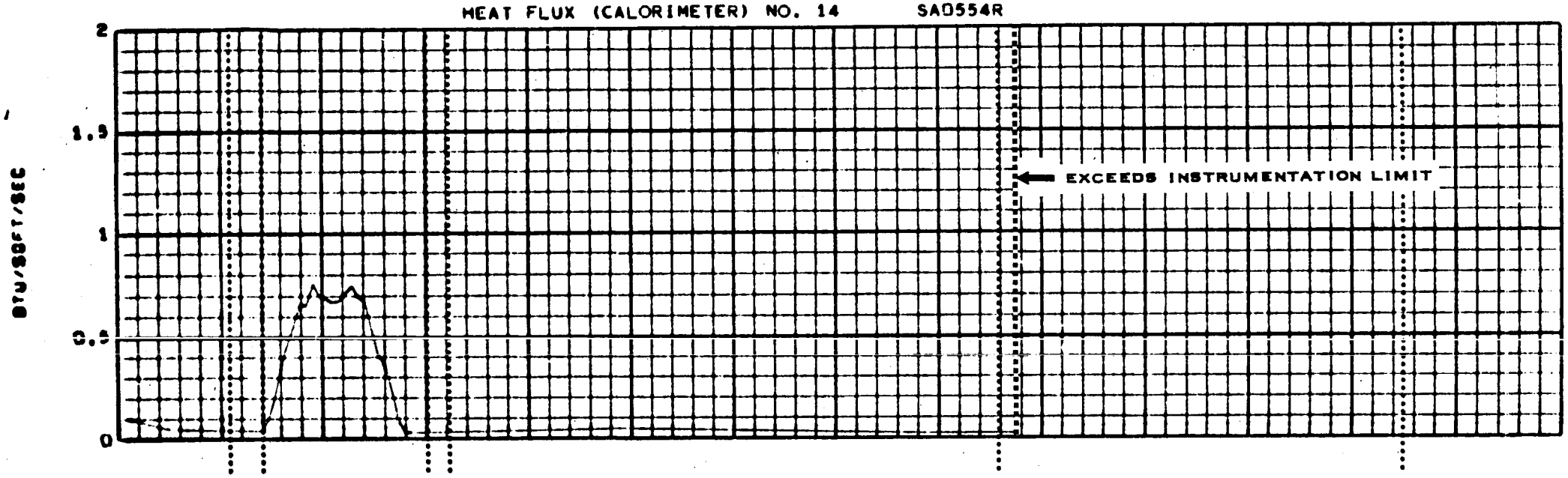
CONFIDENTIAL


SA 0564T
Xs 267
160 deg
SA 0554R
Xs 267
160 deg
180°
-Z
270°
-Y
-X
+X
+Y
90°
+Z
0°

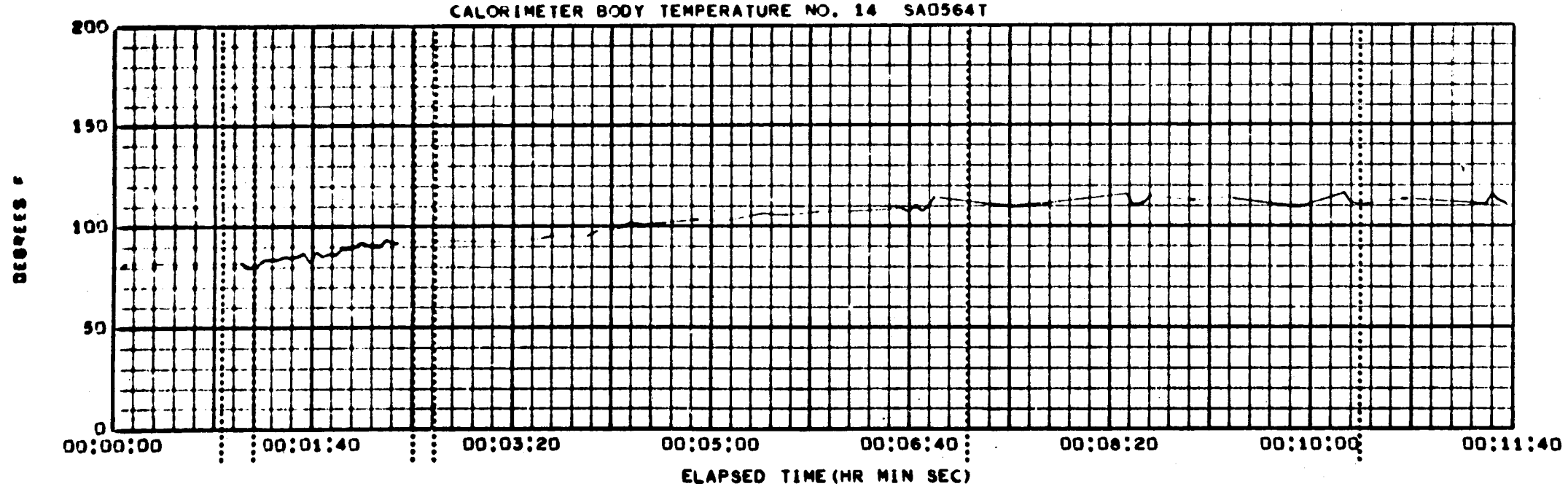
00:00:54.35 TRANSONIC
00:01:10.20 MAX Q
00:02:30.90 S-IV IGNITION
00:02:41.20 TOWER JETTISON
00:07:09.50 PEAK ALTITUDE
00:10:24.60 S-IV BURNOUT

CONFIDENTIAL

HEAT FLUX (CALORIMETER) NO. 14 SA0554R

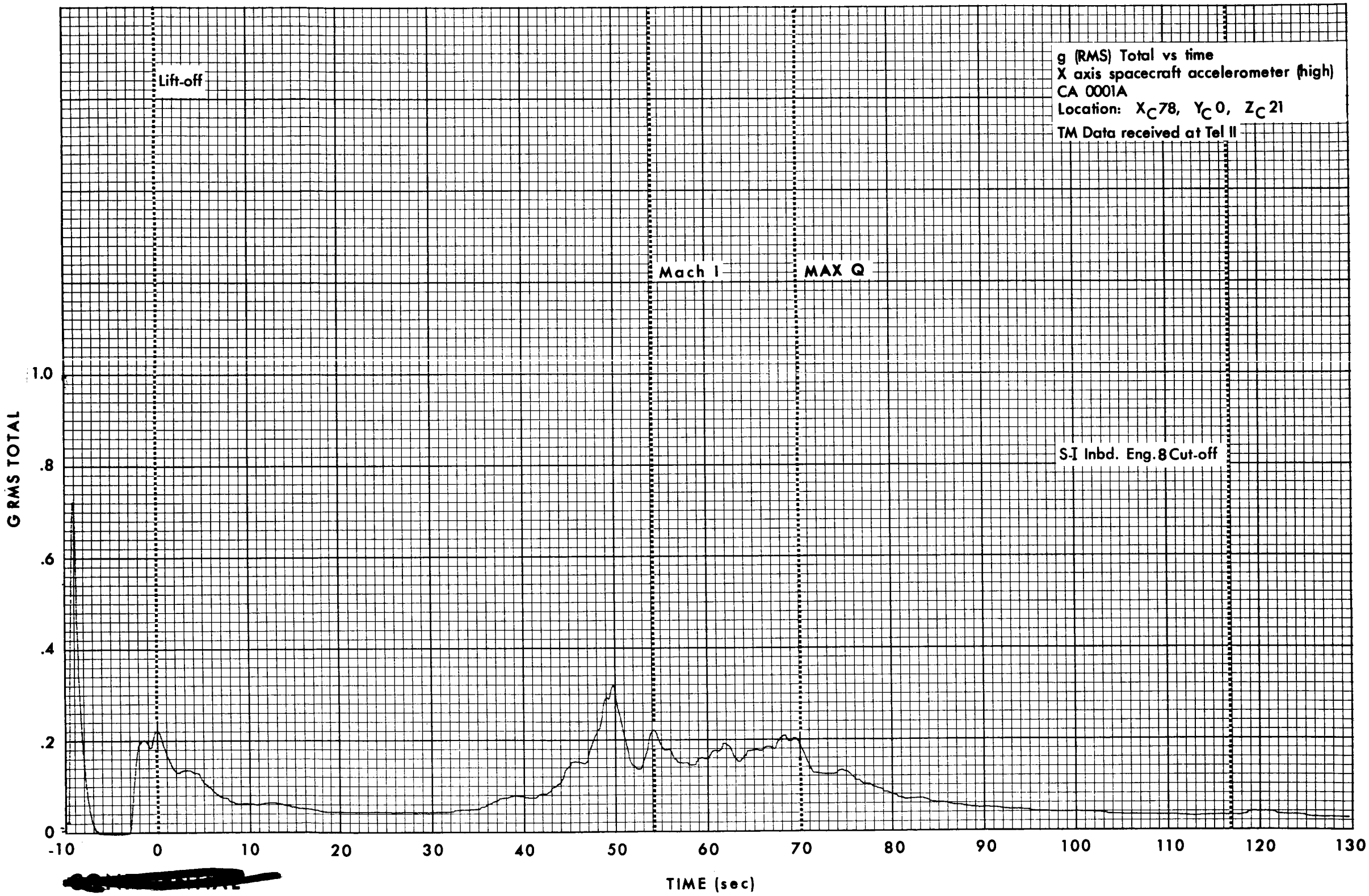


CALORIMETER BODY TEMPERATURE NO. 14 SA0564T



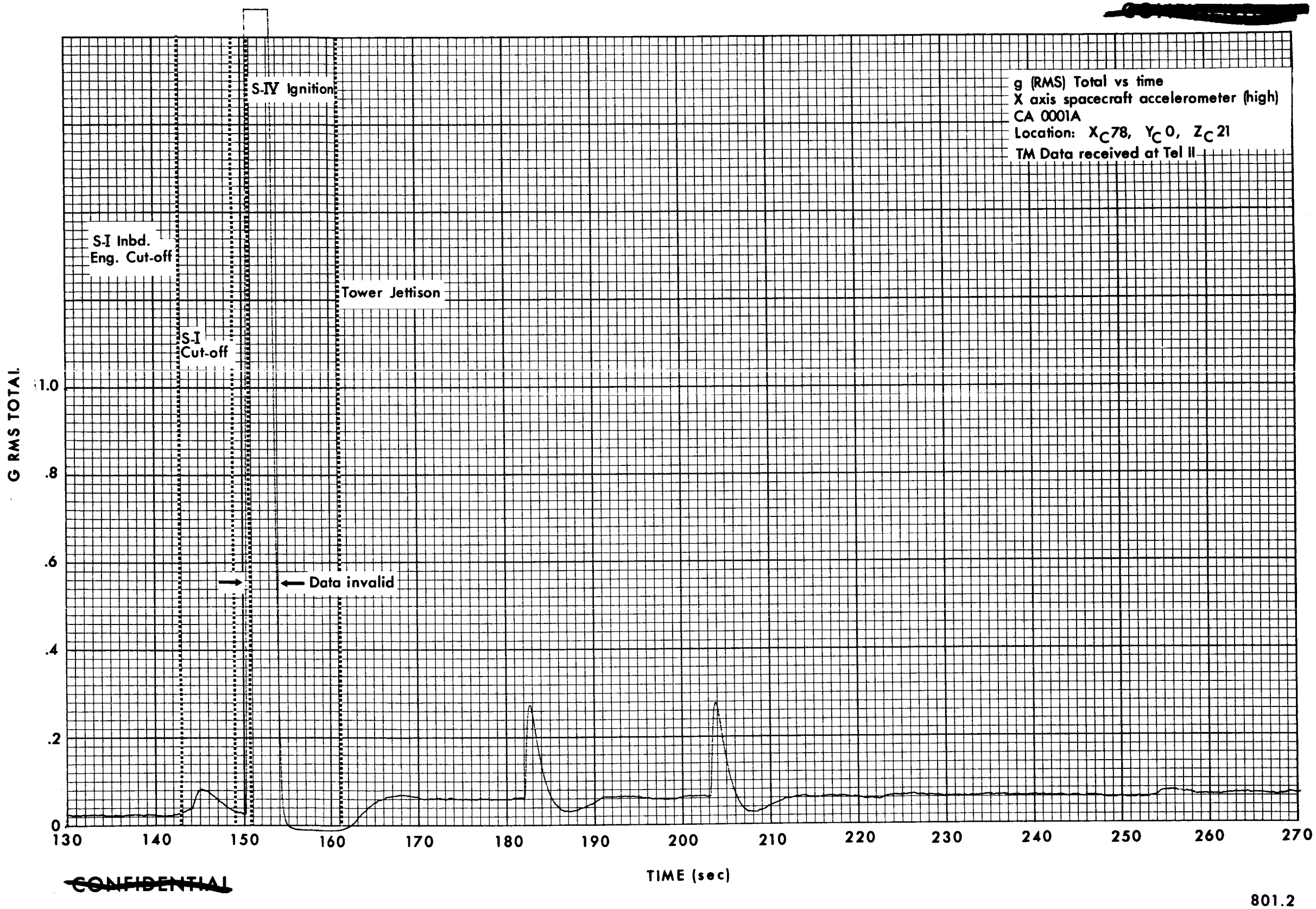
CONFIDENTIAL

[redacted]



[redacted]

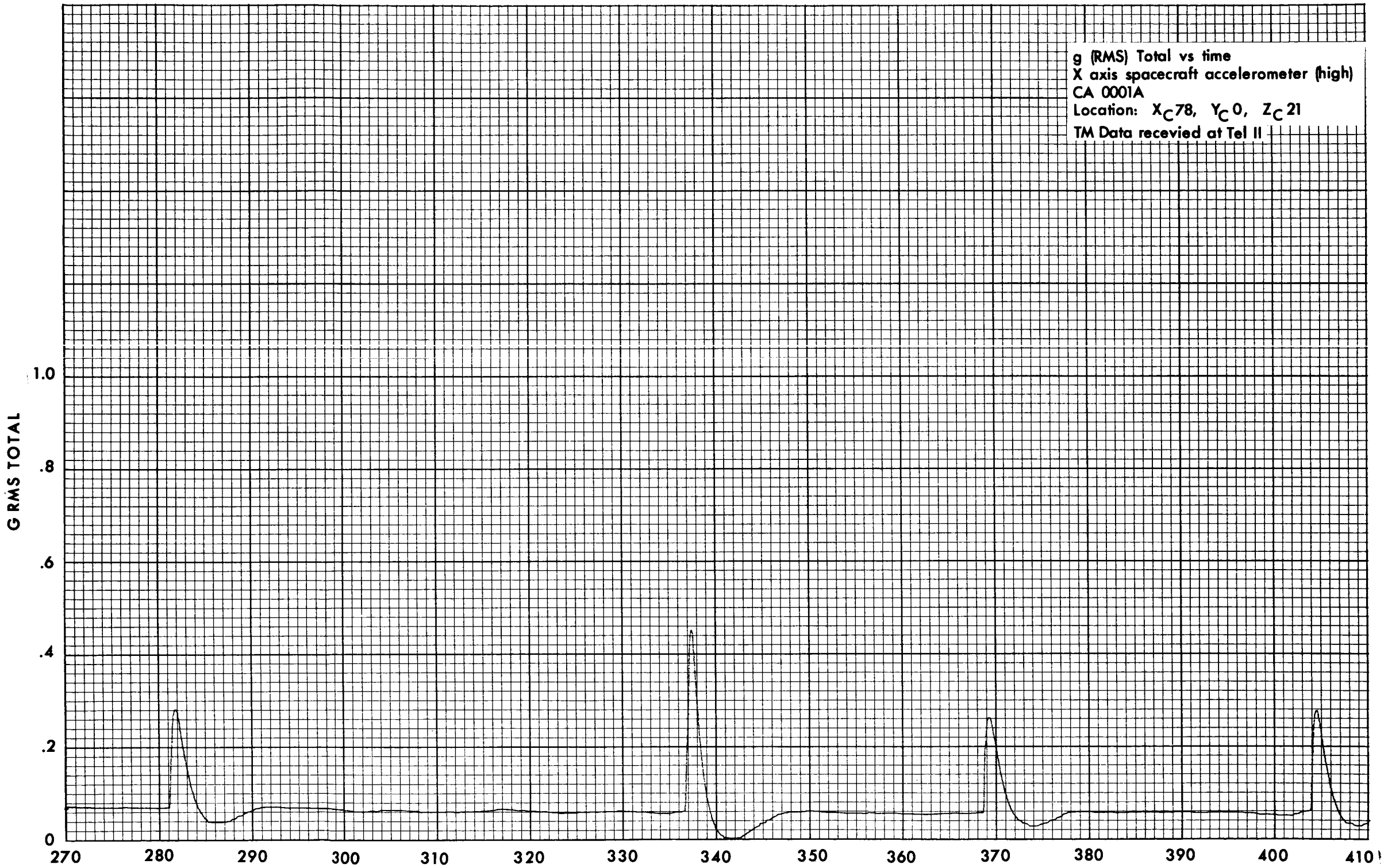
801.1



~~CONFIDENTIAL~~

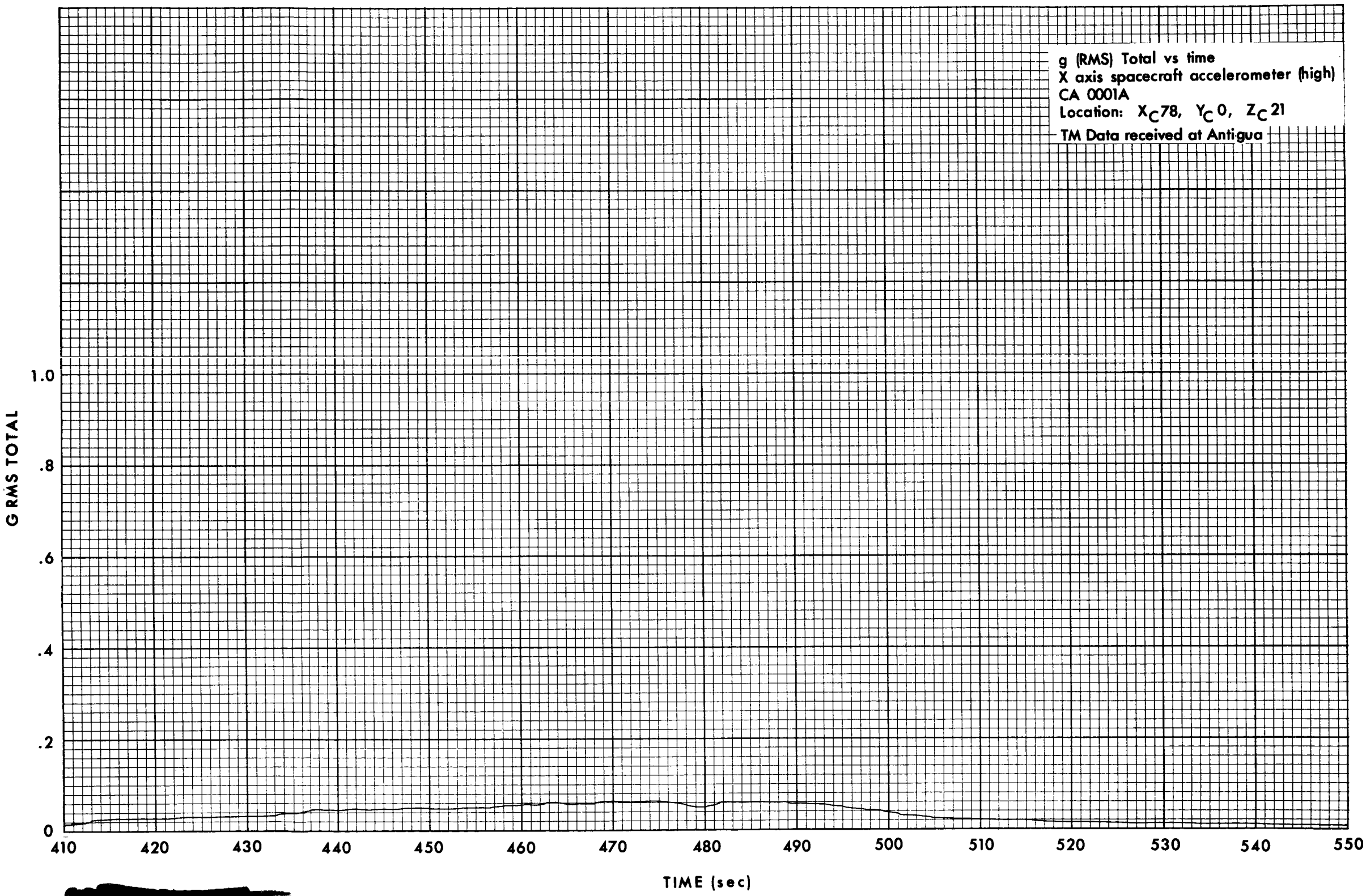
801.2

g (RMS) Total vs time
X axis spacecraft accelerometer (high)
CA 0001A
Location: X_C 78, Y_C 0, Z_C 21
TM Data recevied at Tel II



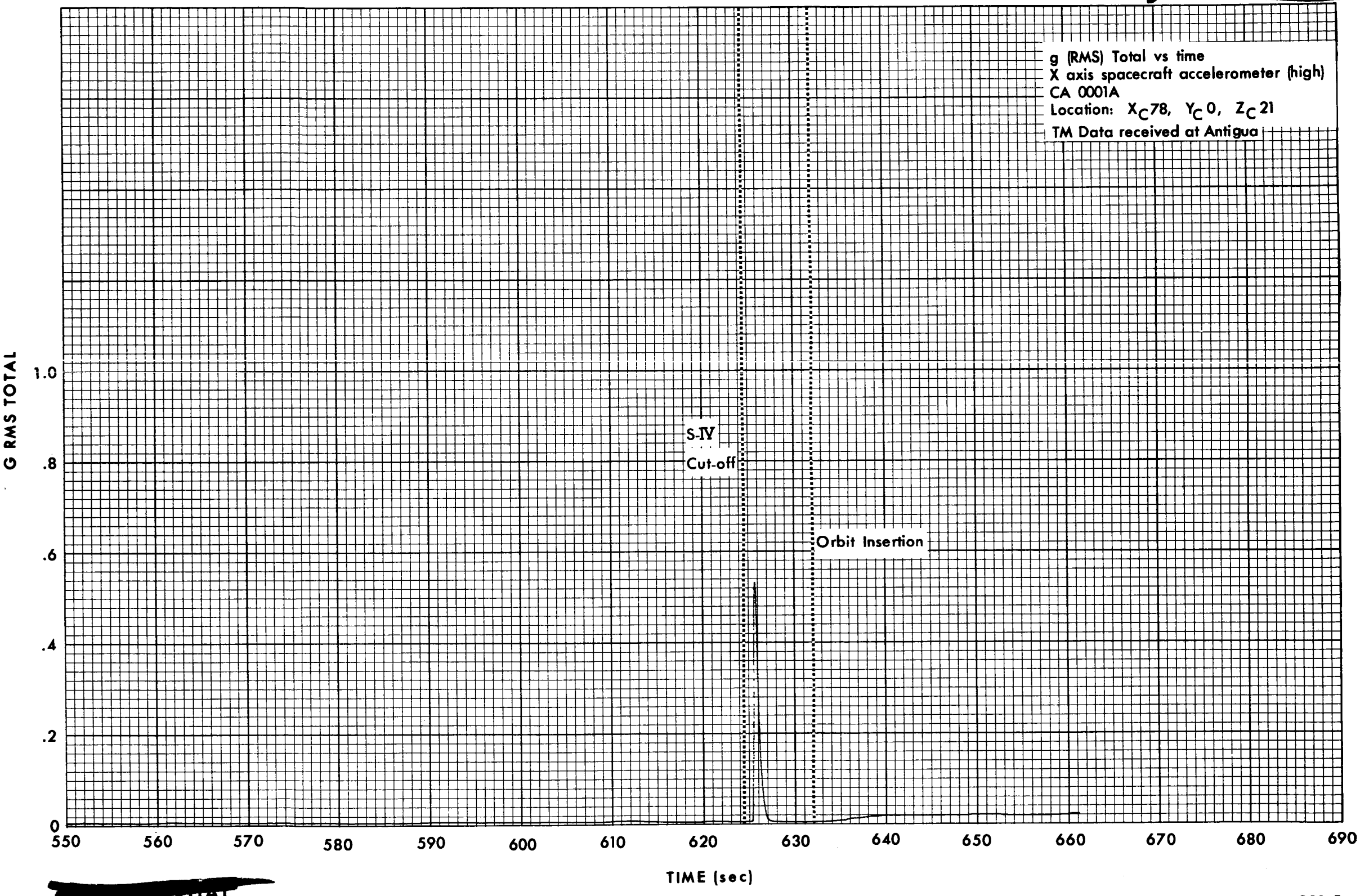
801.3

g (RMS) Total vs time
X axis spacecraft accelerometer (high)
CA 0001A
Location: X_C 78, Y_C 0, Z_C 21
TM Data received at Antigua



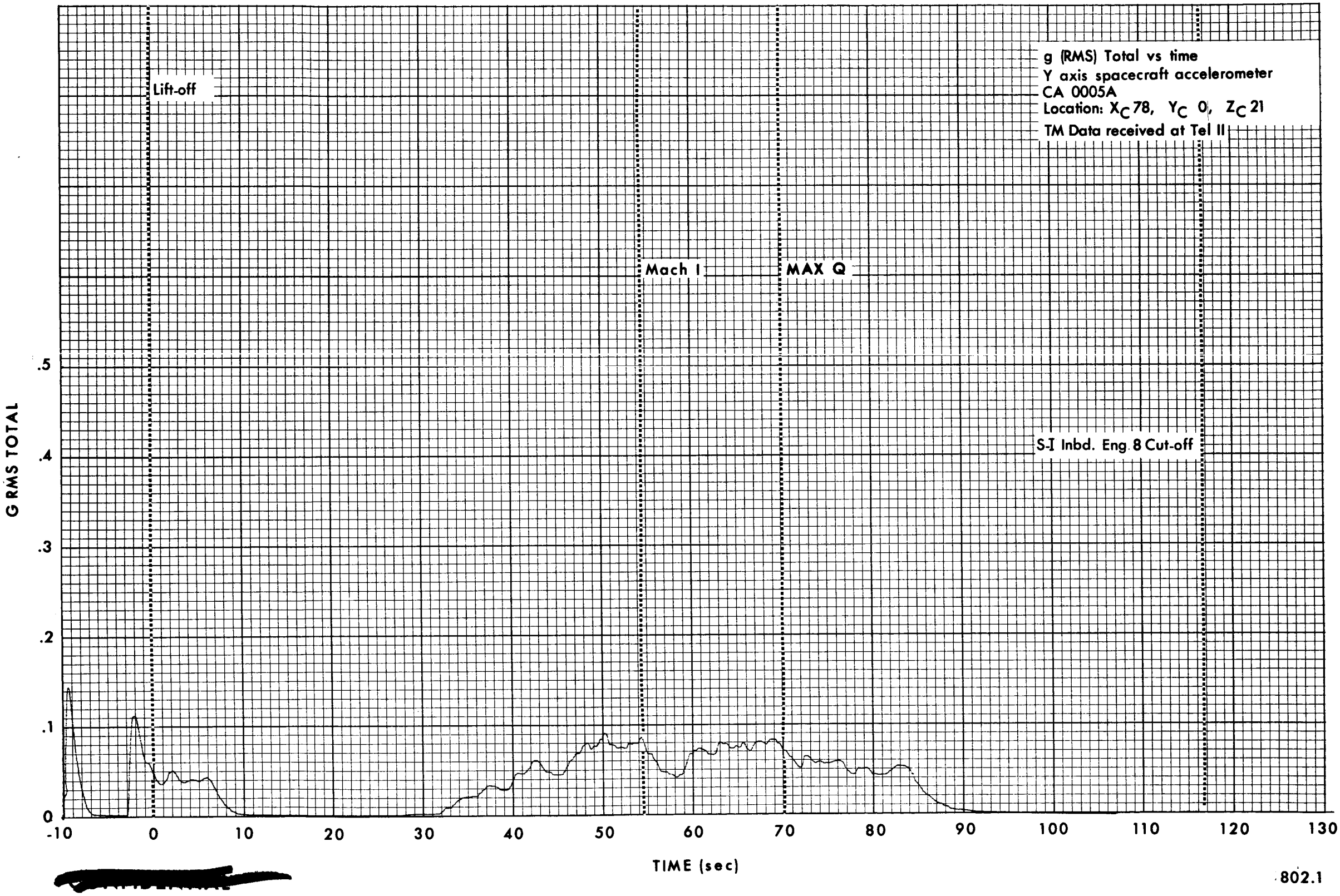
801.4

[redacted]

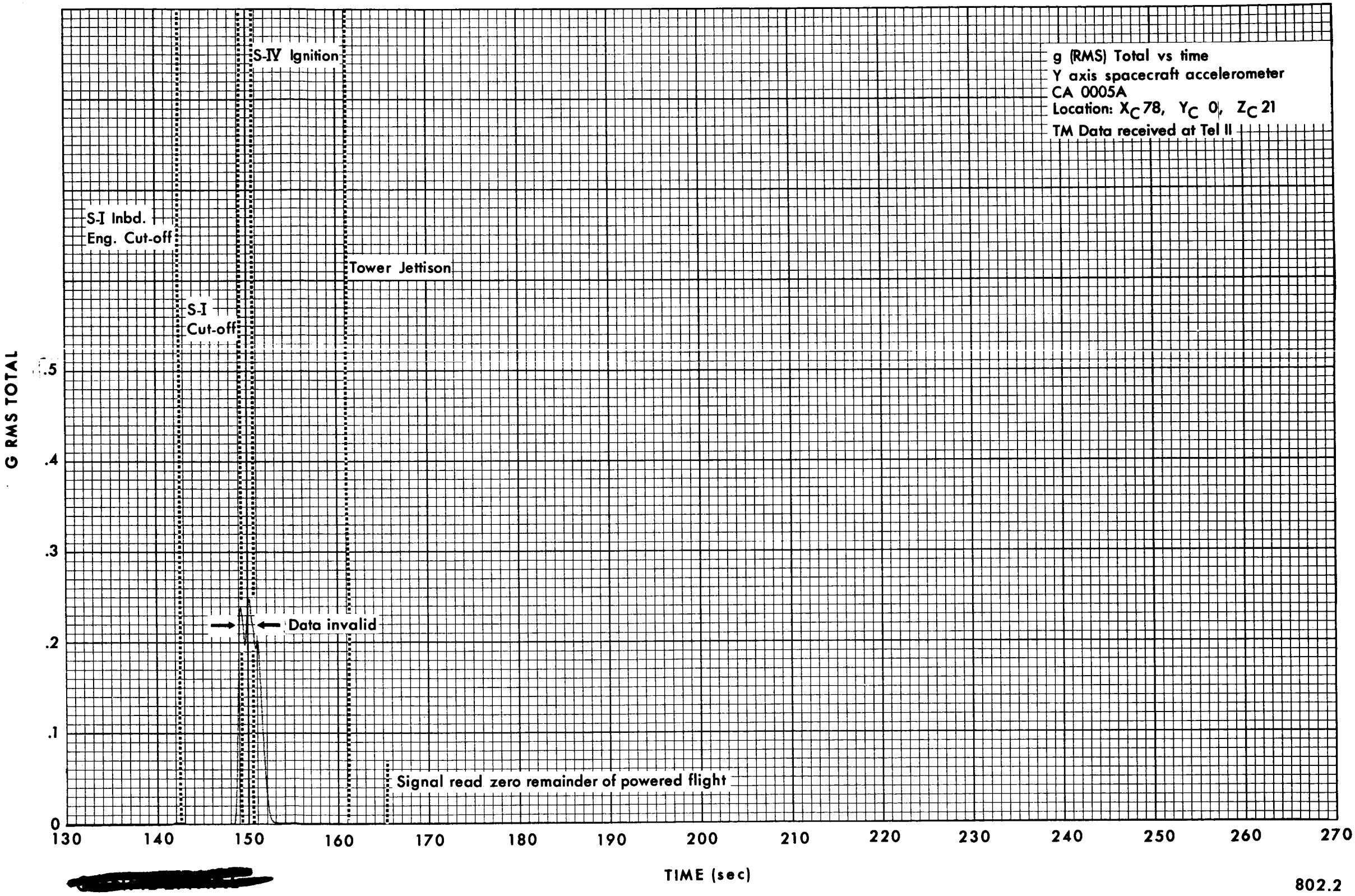


[redacted]

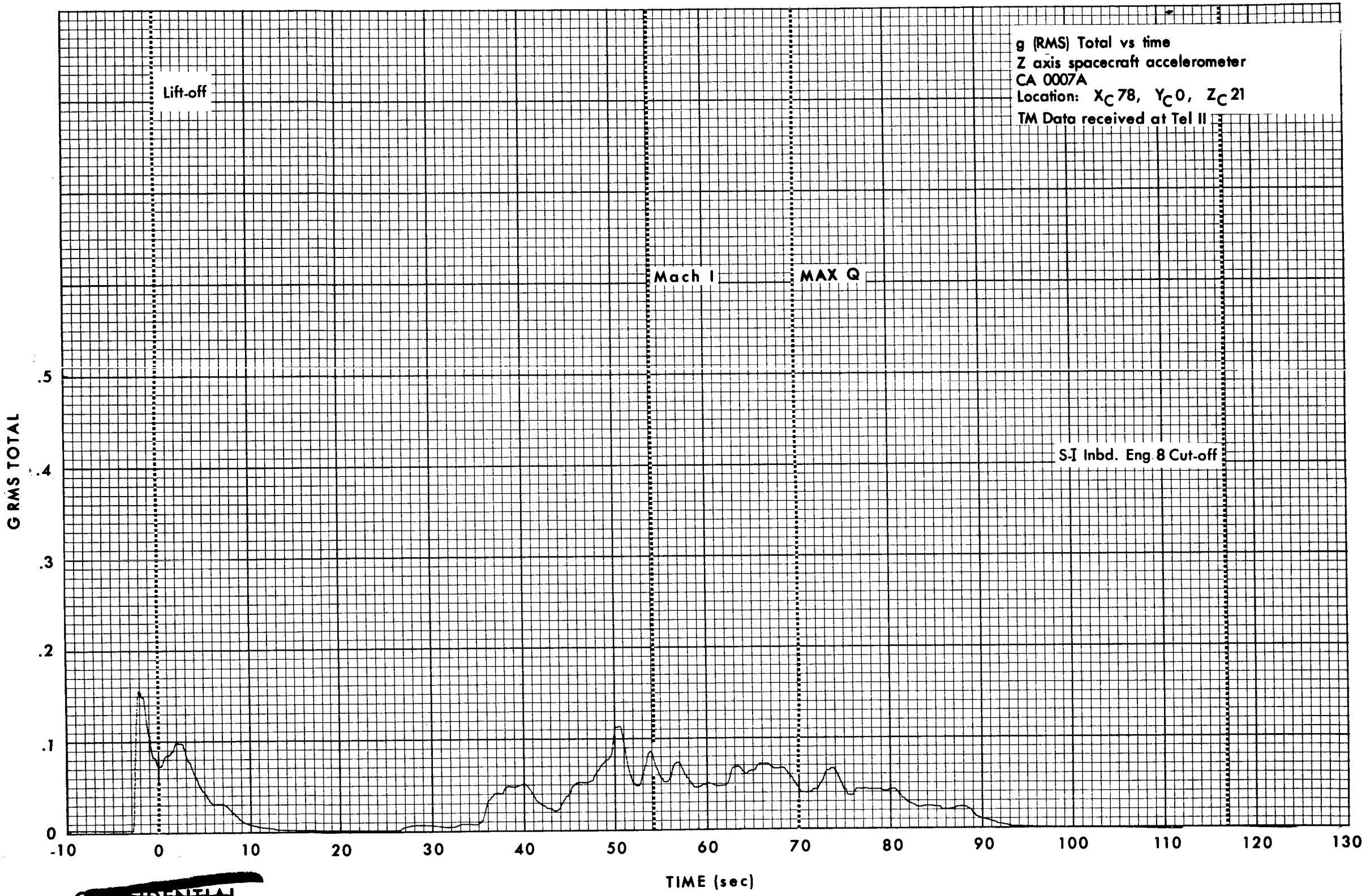
801.5


g (RMS) Total vs time
Y axis spacecraft accelerometer
CA 0005A
Location: X_C 78, Y_C 0, Z_C 21
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
G RMS TOTAL
0
.1
.2
.3
.4
.5
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

802.1

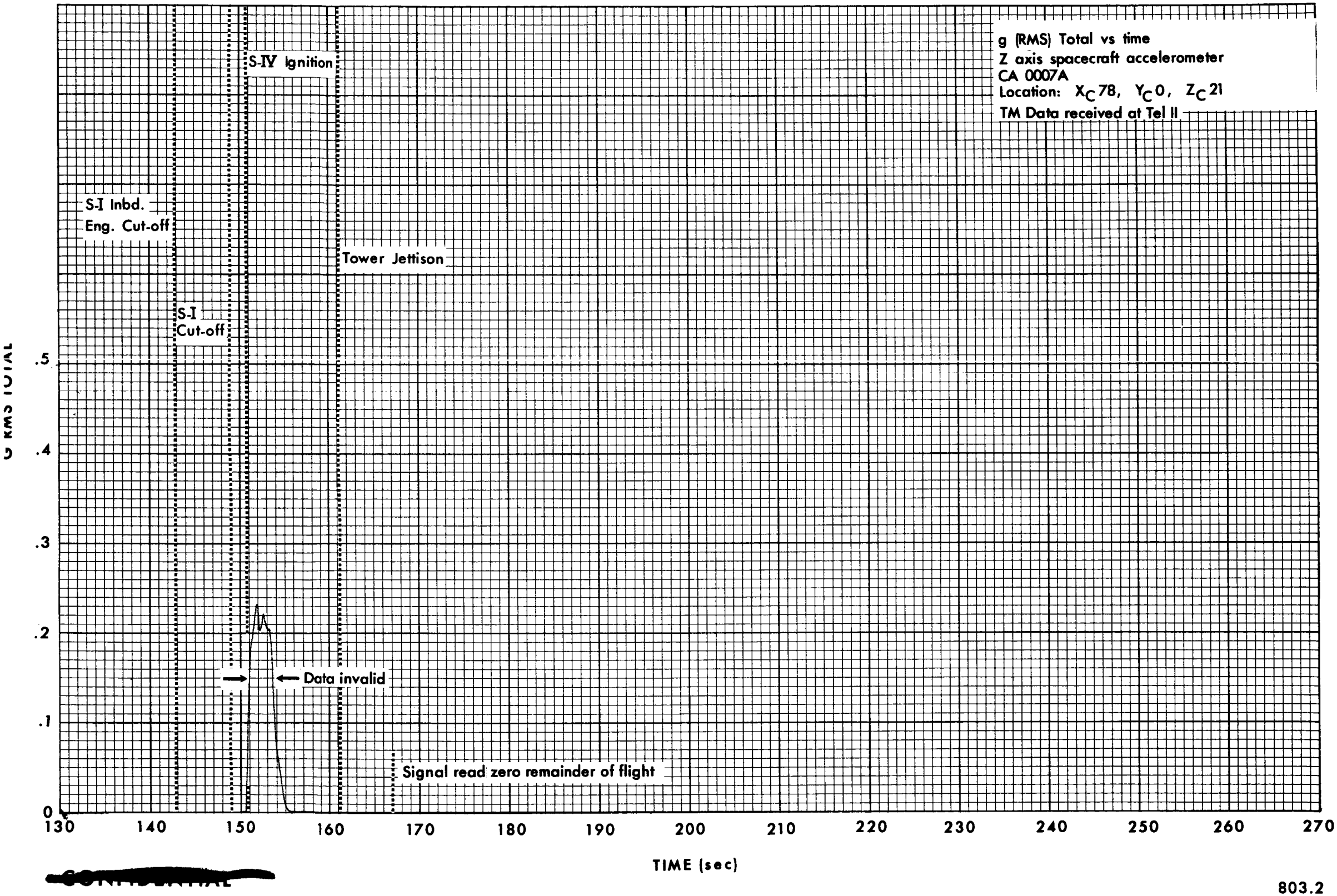

g (RMS) Total vs time
Y axis spacecraft accelerometer
CA 0005A
Location: X_C 78, Y_C 0, Z_C 21
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
G RMS TOTAL
.5
.4
.3
.2
.1
0
Data invalid
Signal read zero remainder of powered flight
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

802.2


g (RMS) Total vs time
Z axis spacecraft accelerometer
CA 0007A
Location: X_C 78, Y_C 0, Z_C 21
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
G RMS TOTAL
0
.1
.2
.3
.4
.5
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

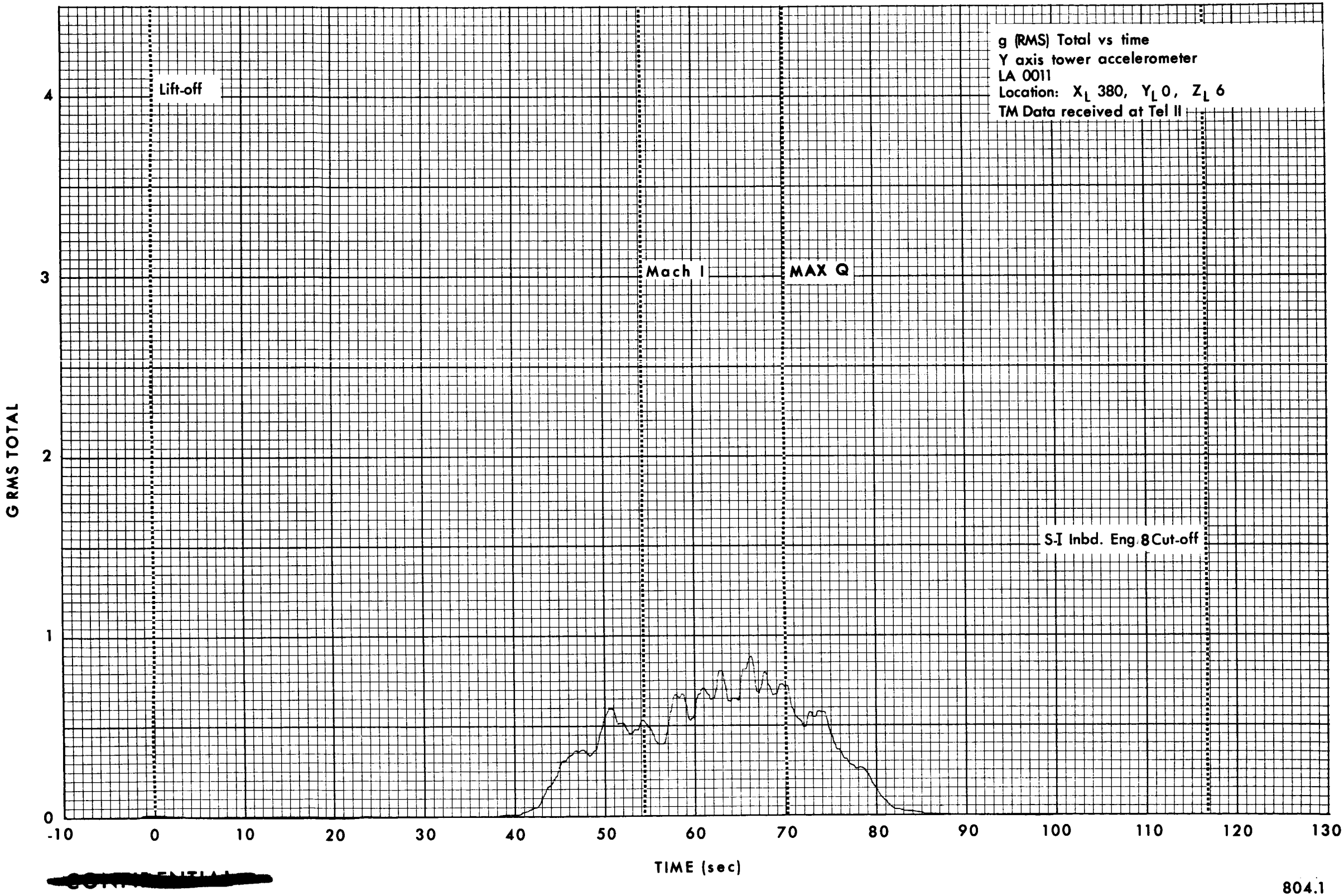
803.1

CONFIDENTIAL

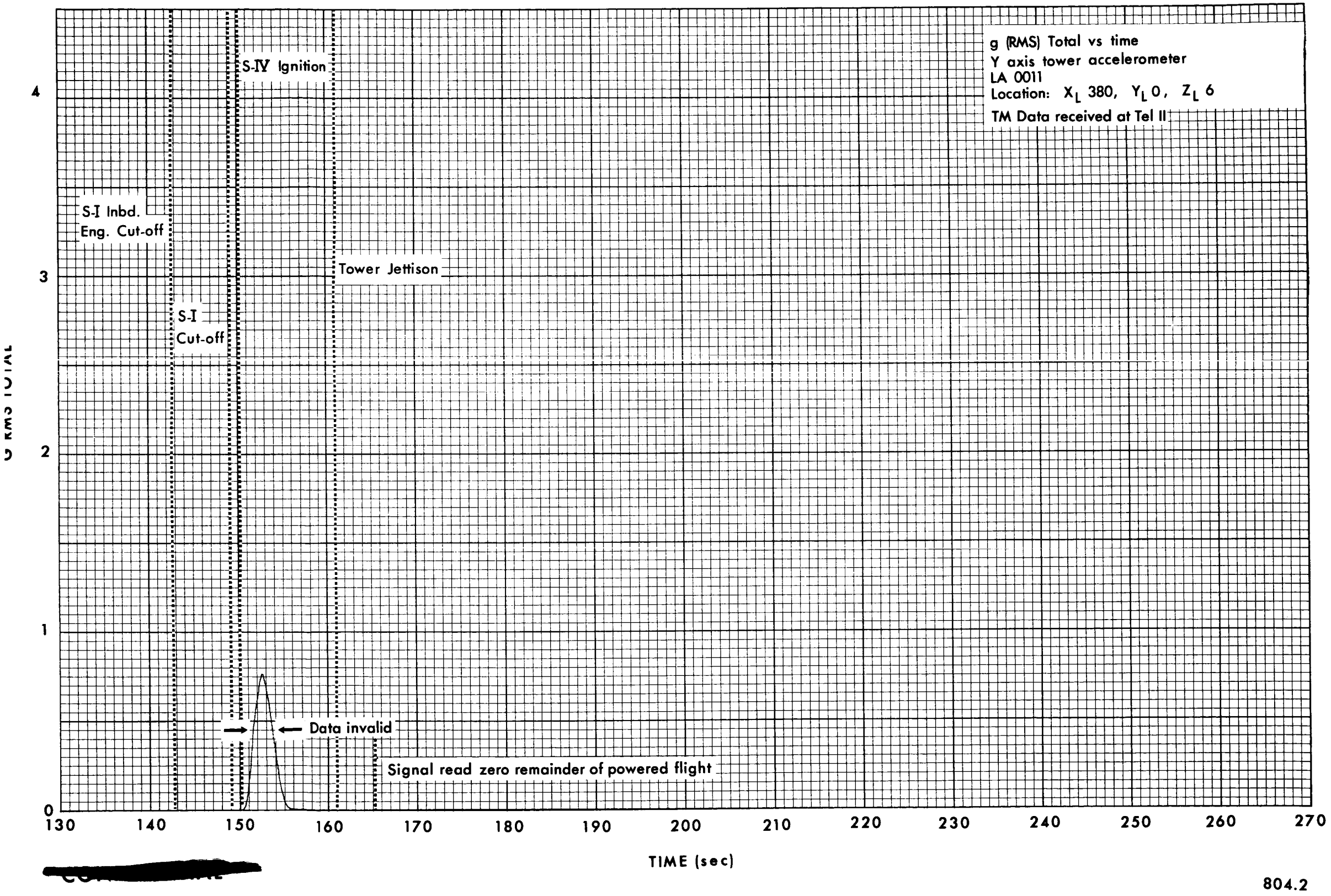


CONFIDENTIAL

803.2

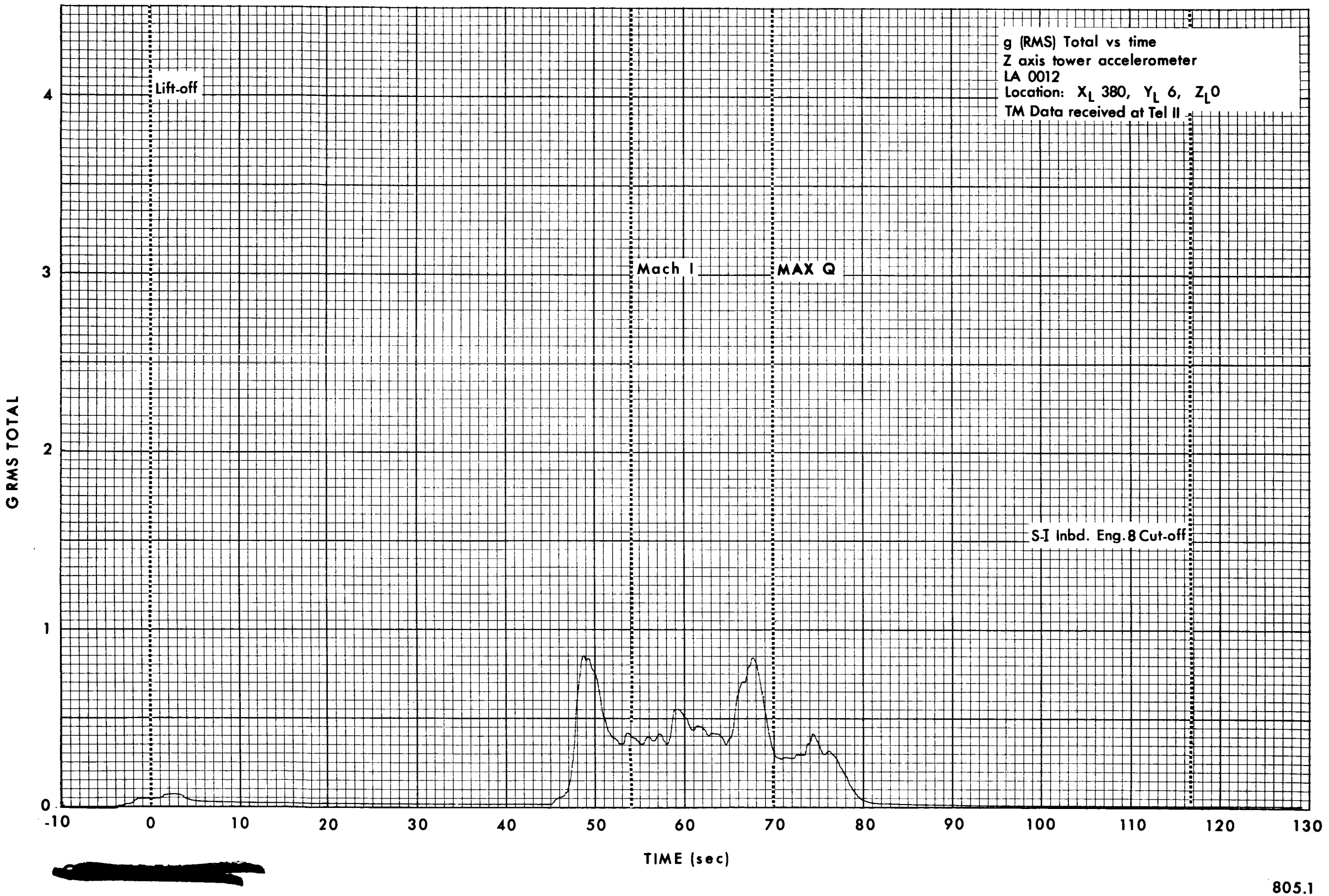

g (RMS) Total vs time
Y axis tower accelerometer
LA 0011
Location: X_L 380, Y_L 0, Z_L 6
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. Cut-off
G RMS TOTAL
0
1
2
3
4
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

CONFIDENTIAL

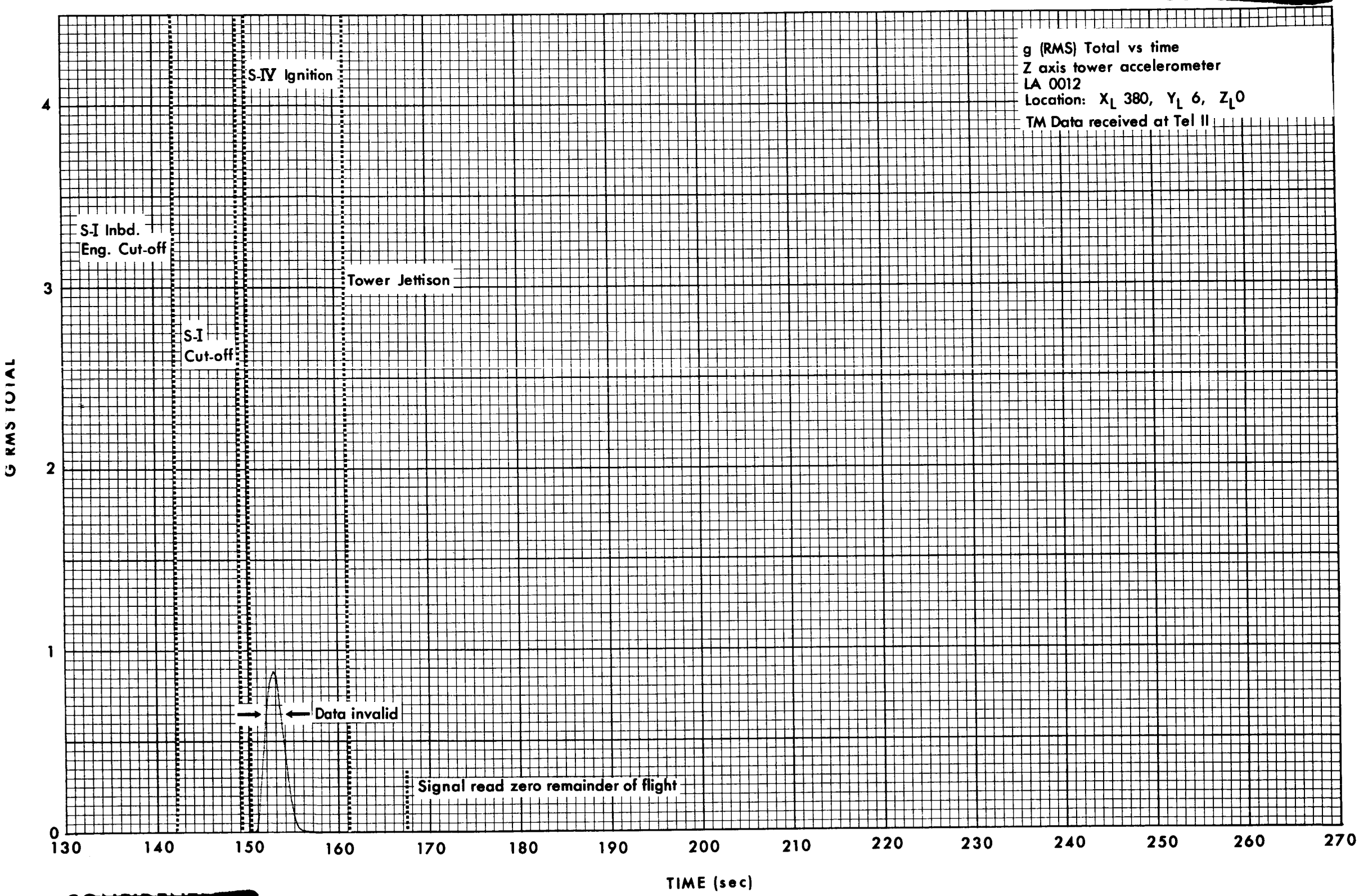


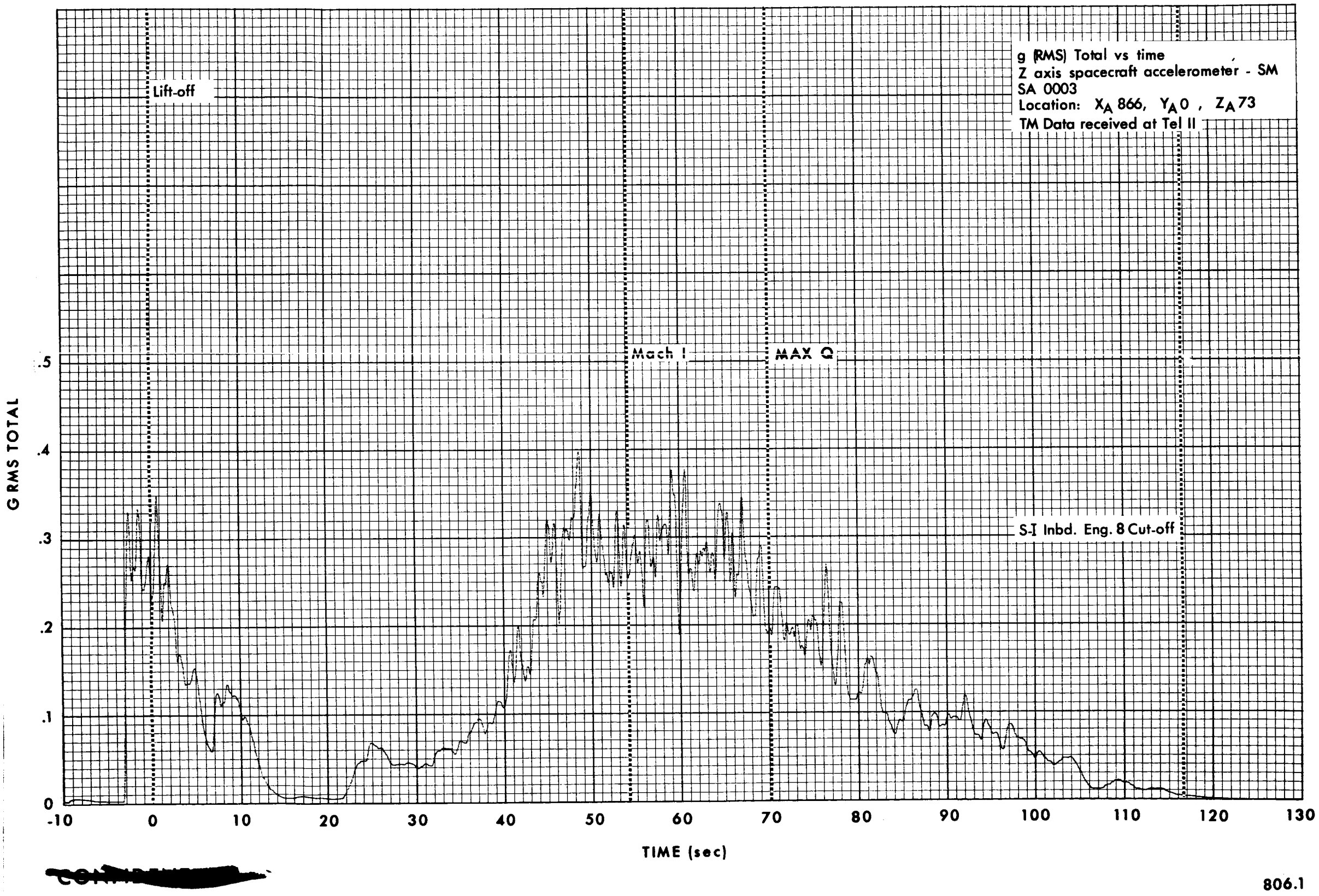
CONFIDENTIAL

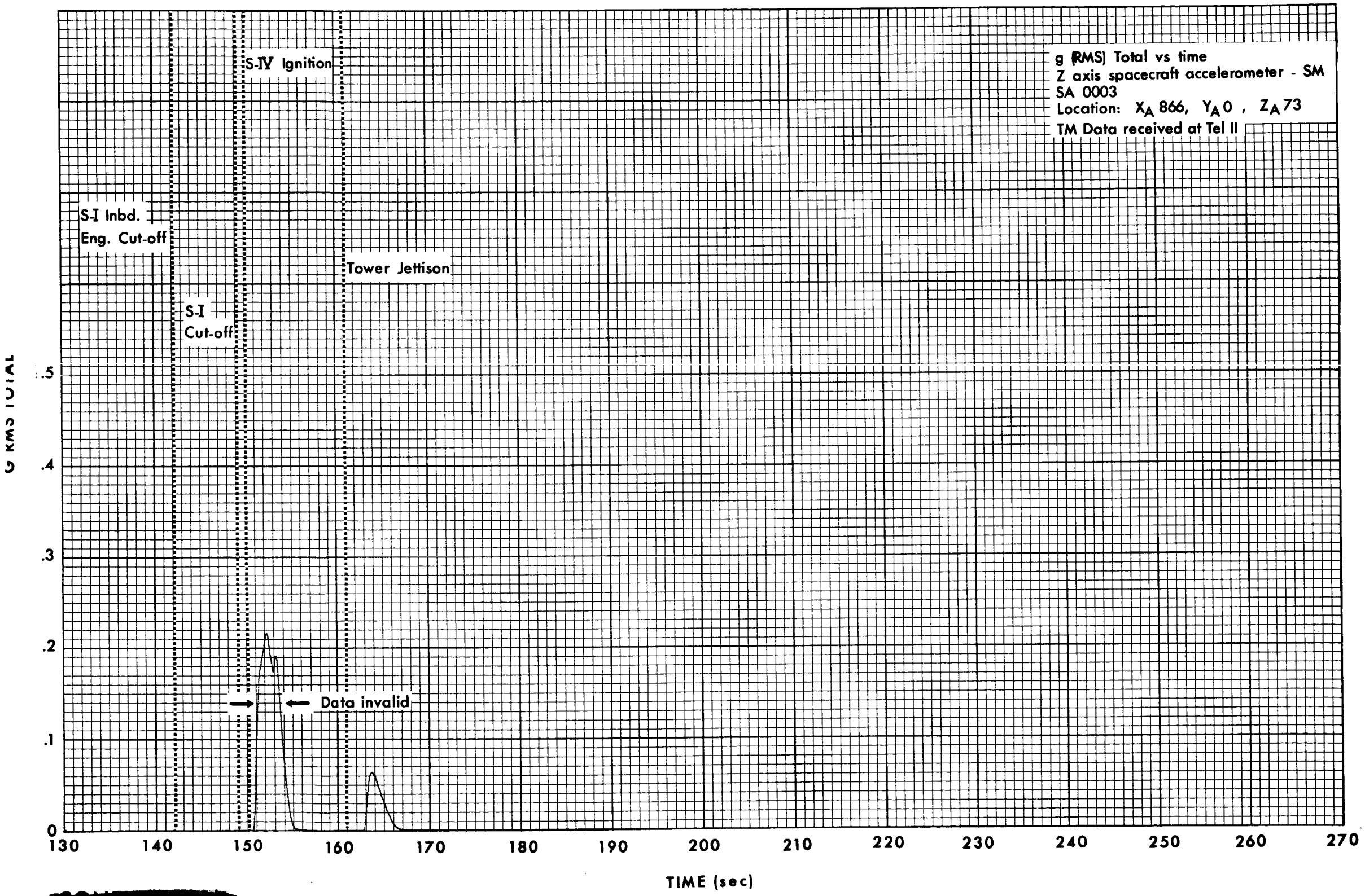
804.2


g (RMS) Total vs time
Z axis tower accelerometer
LA 0012
Location: X_L 380, Y_L 6, Z_L 0
TM Data received at Tel II
Lift-off
Mach I
MAX Q
S-I Inbd. Eng. 8 Cut-off
G RMS TOTAL
0
1
2
3
4
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

805.1

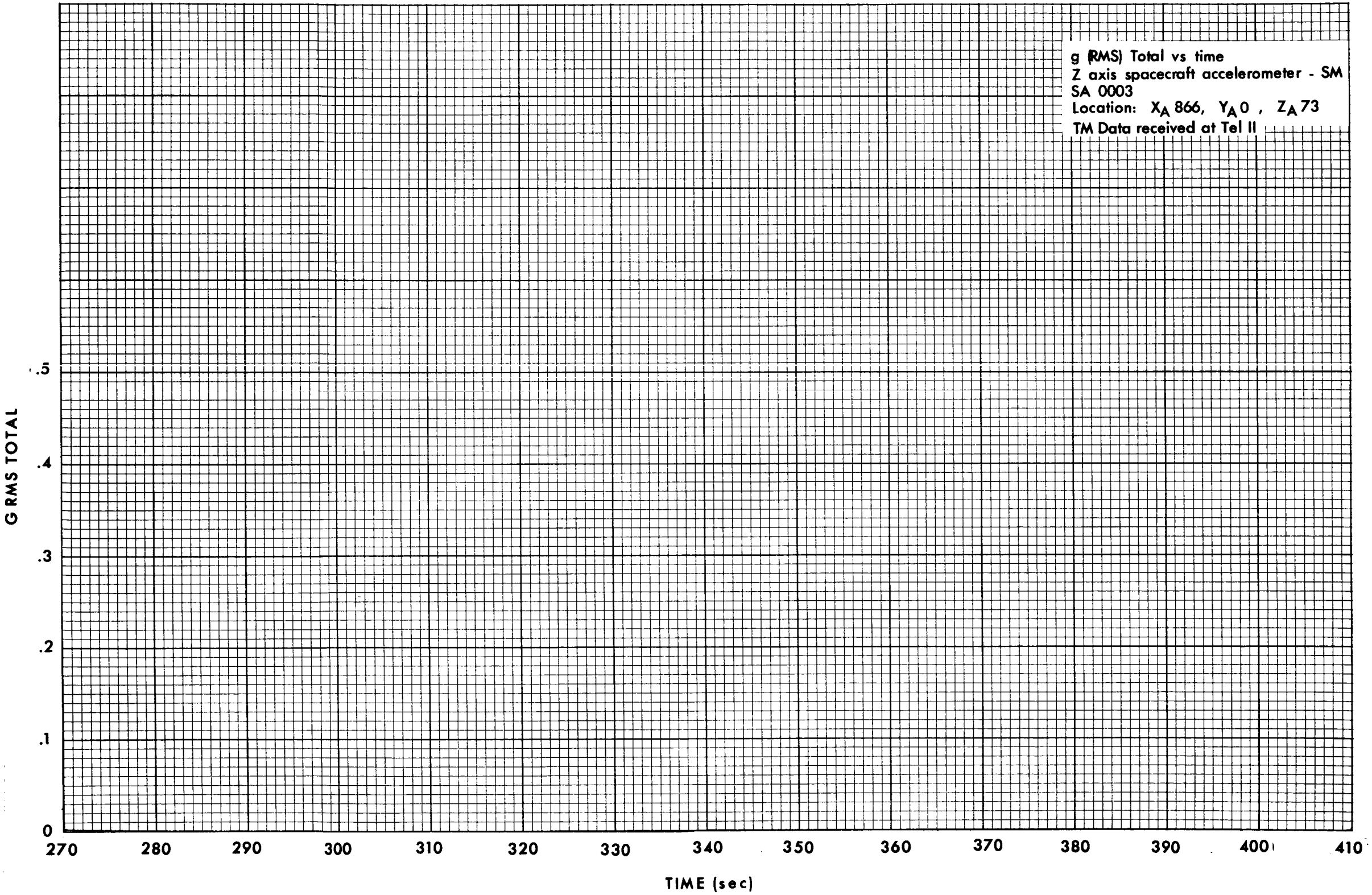

g (RMS) Total vs time
Z axis tower accelerometer
LA 0012
Location: X_L 380, Y_L 6, Z_L 0
TM Data received at Tel II
S-IV Ignition
S-I Inbd. Eng. Cut-off
Tower Jettison
S-I Cut-off
Data invalid
Signal read zero remainder of flight
G RMS TOTAL
0
1
2
3
4
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)


g (RMS) Total vs time
Z axis spacecraft accelerometer - SM
SA 0003
Location: X_A 866, Y_A 0 , Z_A 73
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
G RMS TOTAL
0
.1
.2
.3
.4
.5
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

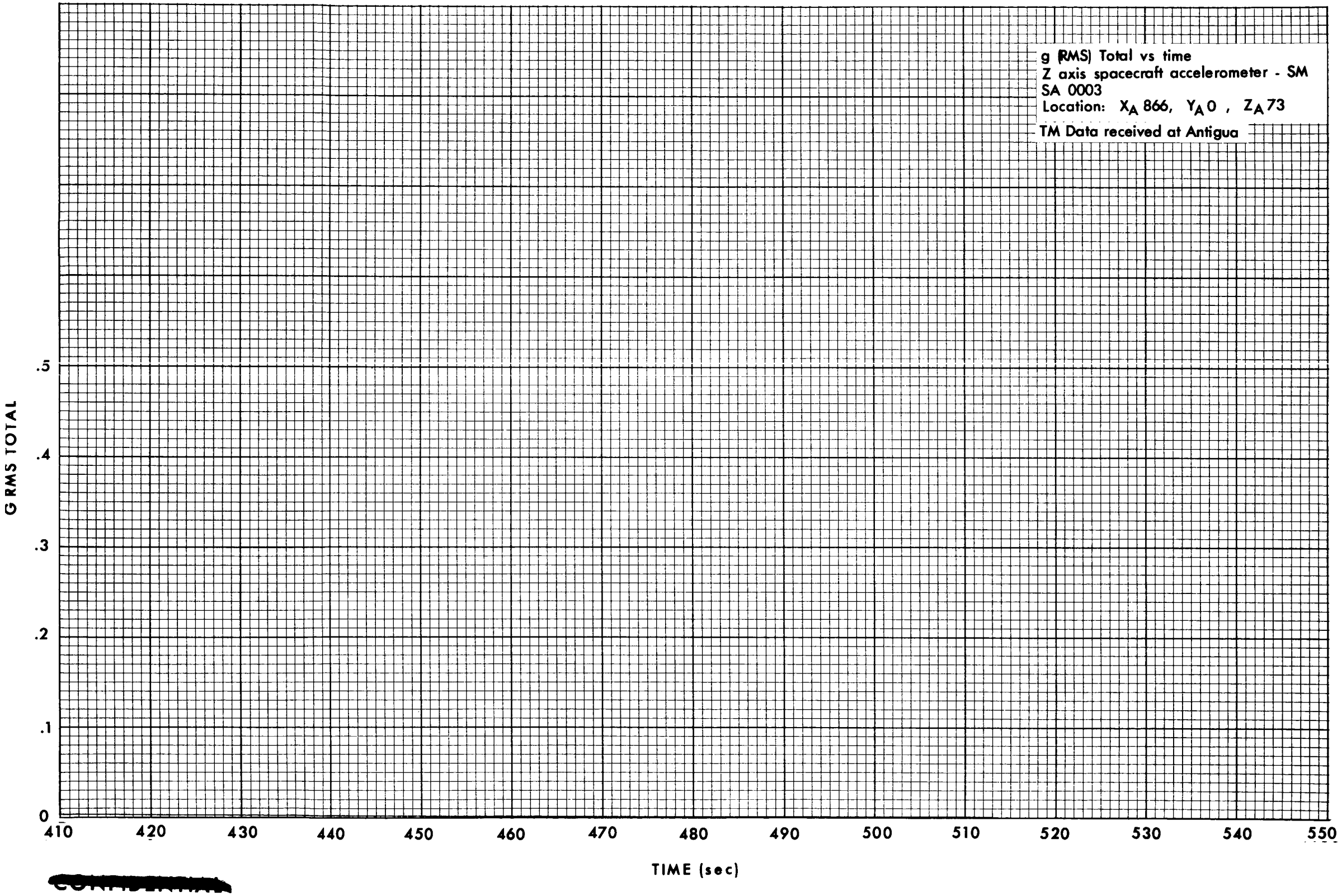

g (RMS) Total vs time
Z axis spacecraft accelerometer - SM
SA 0003
Location: X_A 866, Y_A 0 , Z_A 73
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
g RMS TOTAL
0
.1
.2
.3
.4
.5
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

806.2

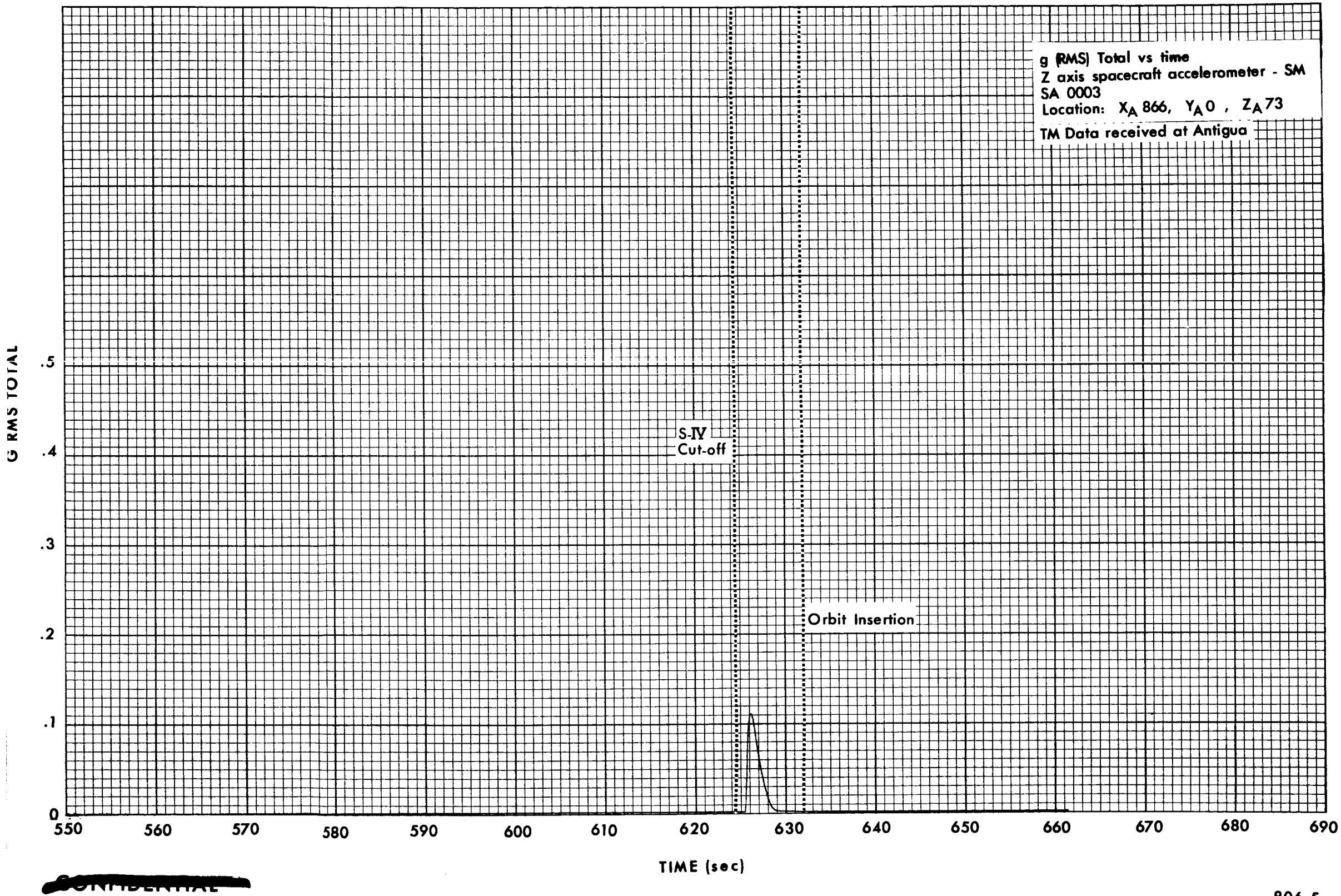
g (RMS) Total vs time
Z axis spacecraft accelerometer - SM
SA 0003
Location: X_A 866, Y_A 0 , Z_A 73
TM Data received at Tel II

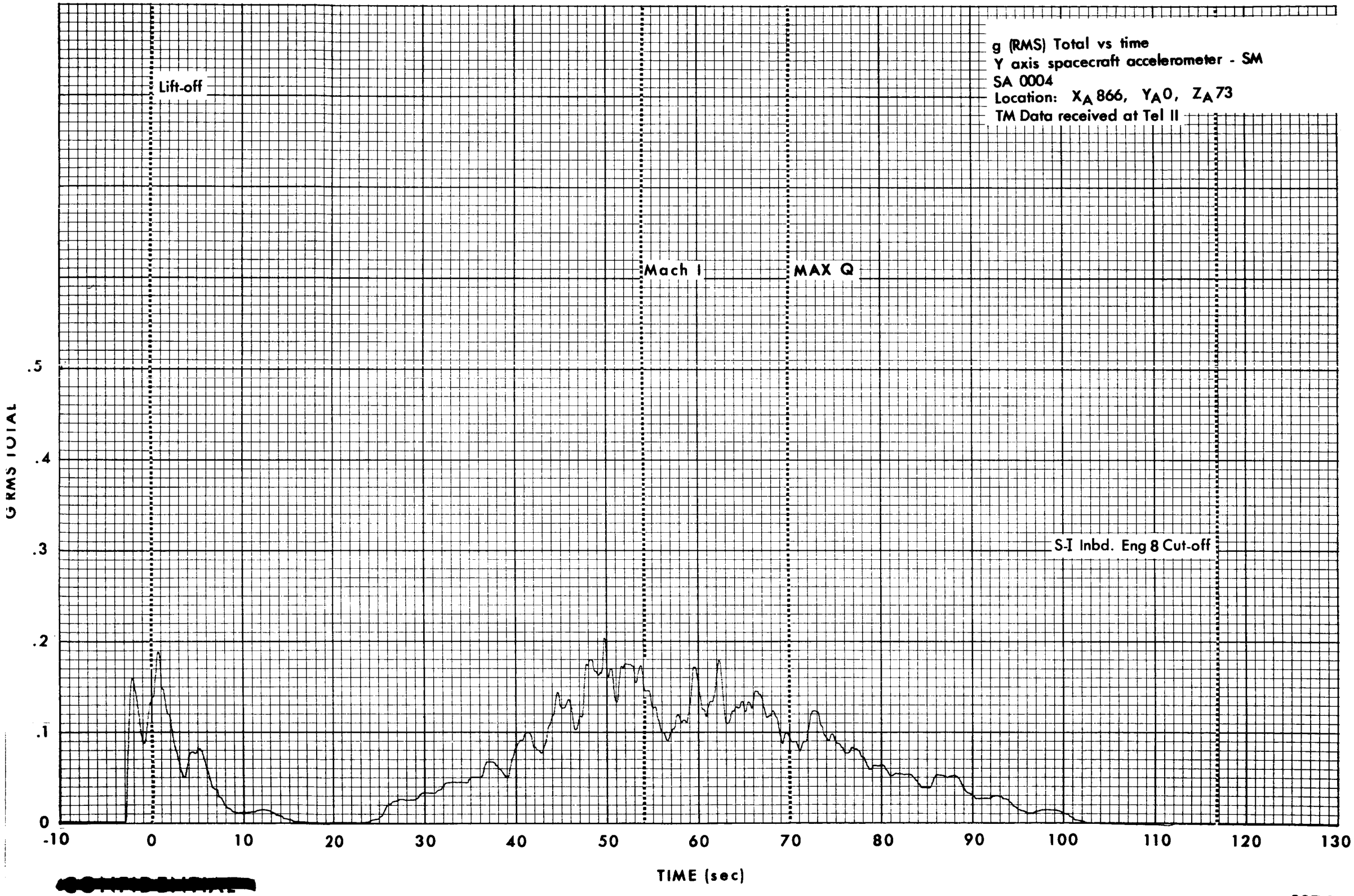


g (RMS) Total vs time
Z axis spacecraft accelerometer - SM
SA 0003
Location: X_A 866, Y_A 0 , Z_A 73
TM Data received at Antigua

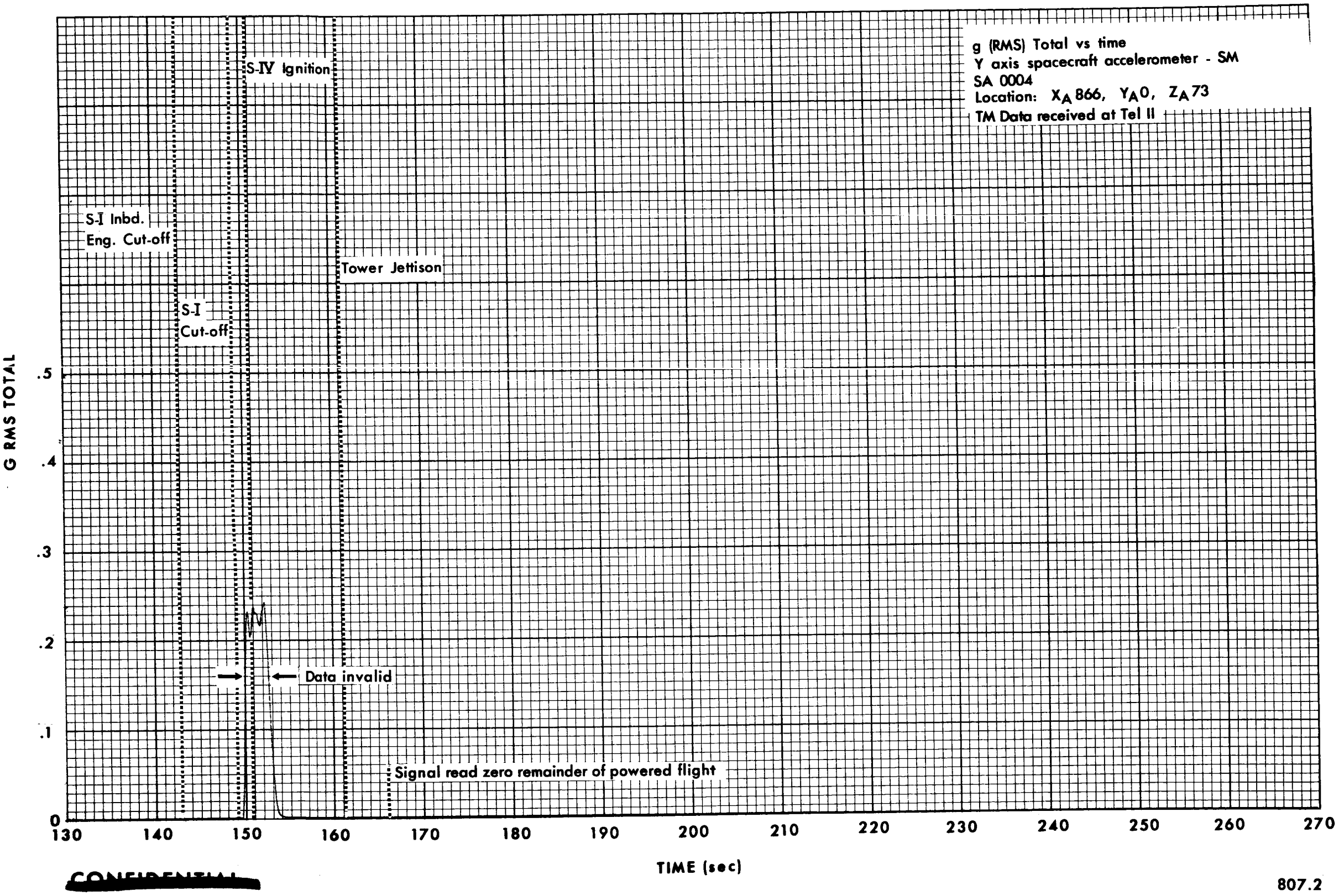


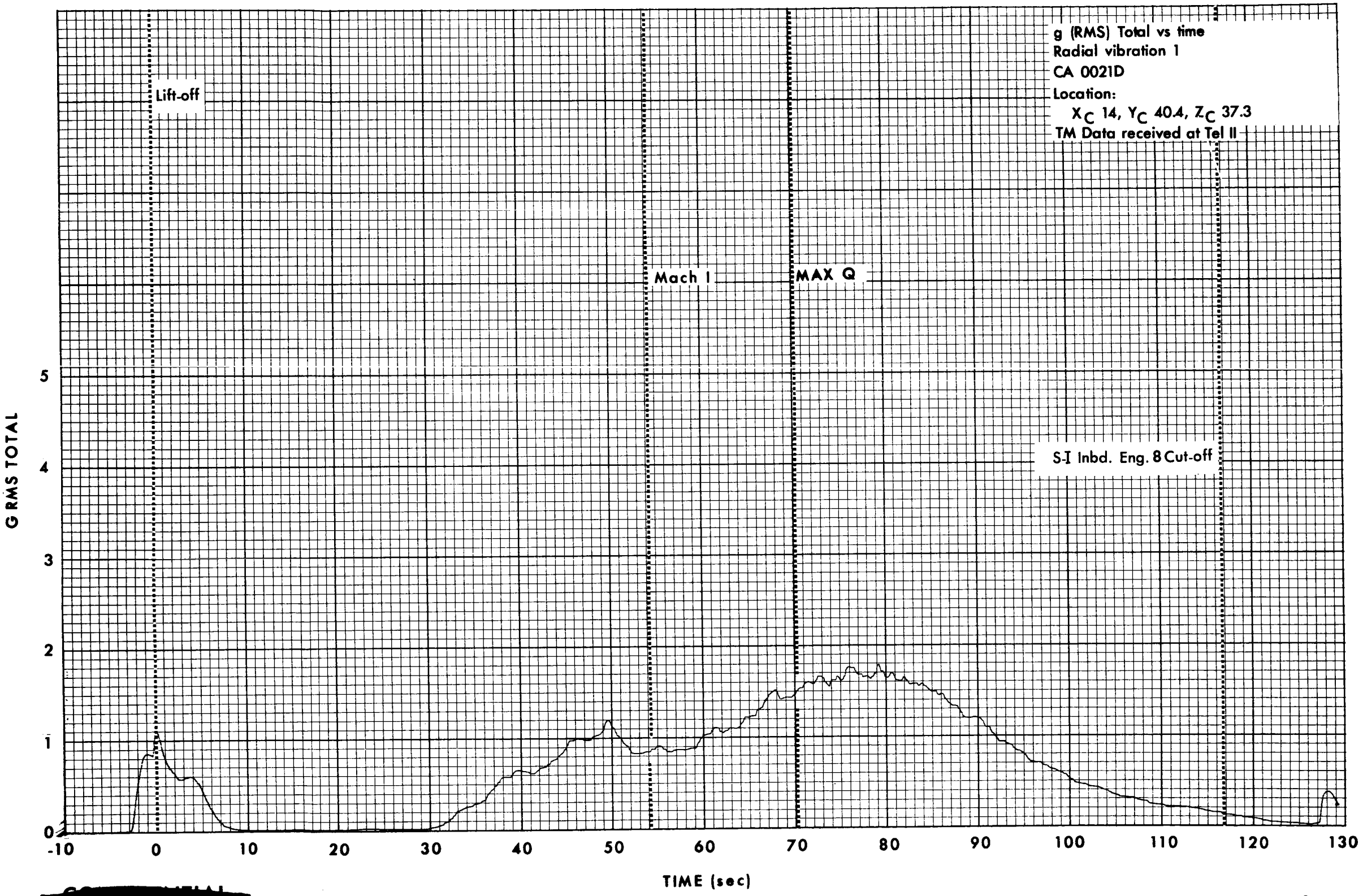
806.4

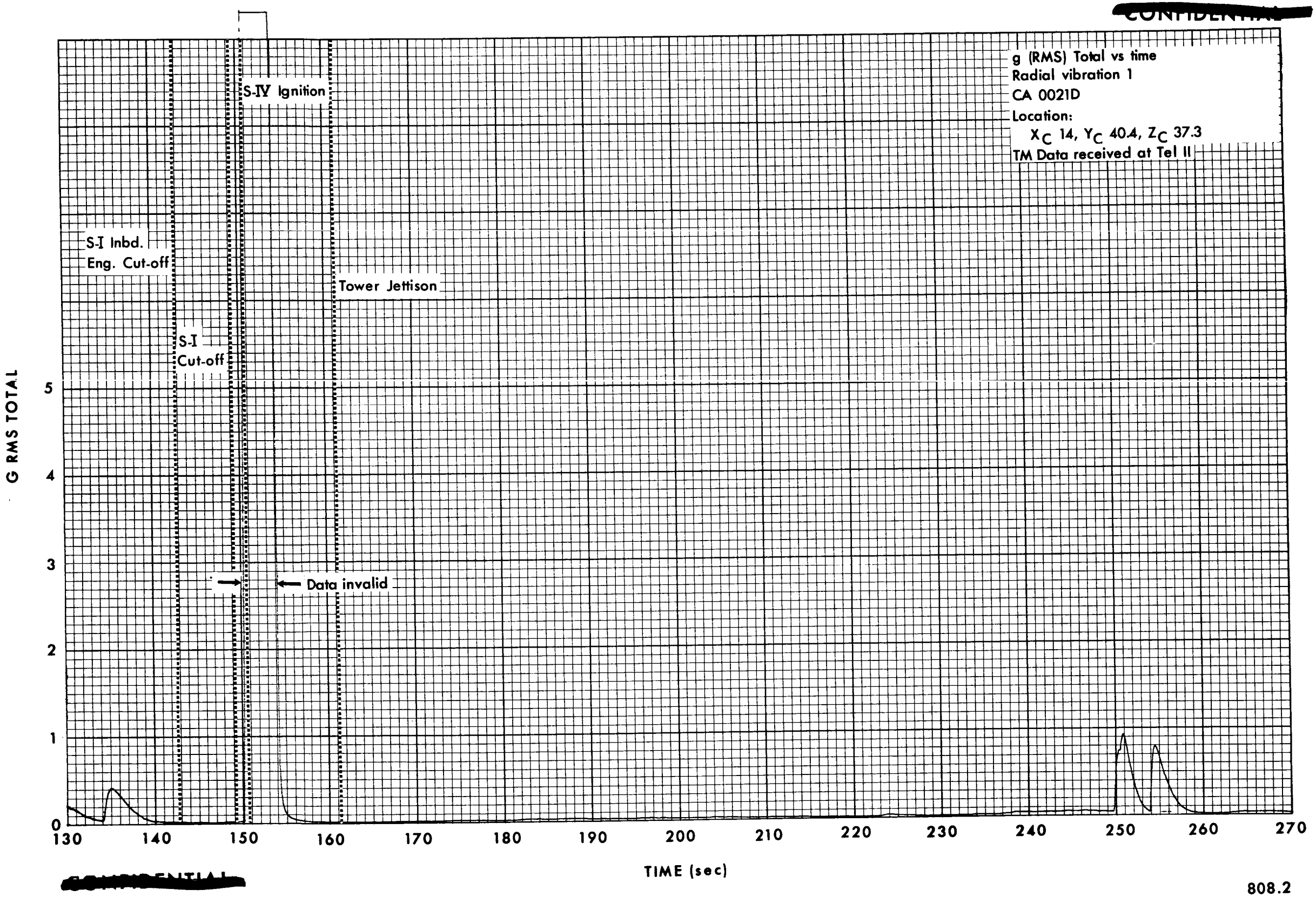

g (RMS) Total vs time
Z axis spacecraft accelerometer - SM
SA 0003
Location: X_A 866, Y_A 0 , Z_A 73
TM Data received at Antigua
G RMS TOTAL
.5
.4
.3
.2
.1
0
S-IV
Cut-off
Orbit Insertion
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690
TIME (sec)


g (RMS) Total vs time
Y axis spacecraft accelerometer - SM
SA 0004
Location: X_A 866, Y_A 0, Z_A 73
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng 8 Cut-off
G RMS TOTAL
.5
.4
.3
.2
.1
0
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

807.1

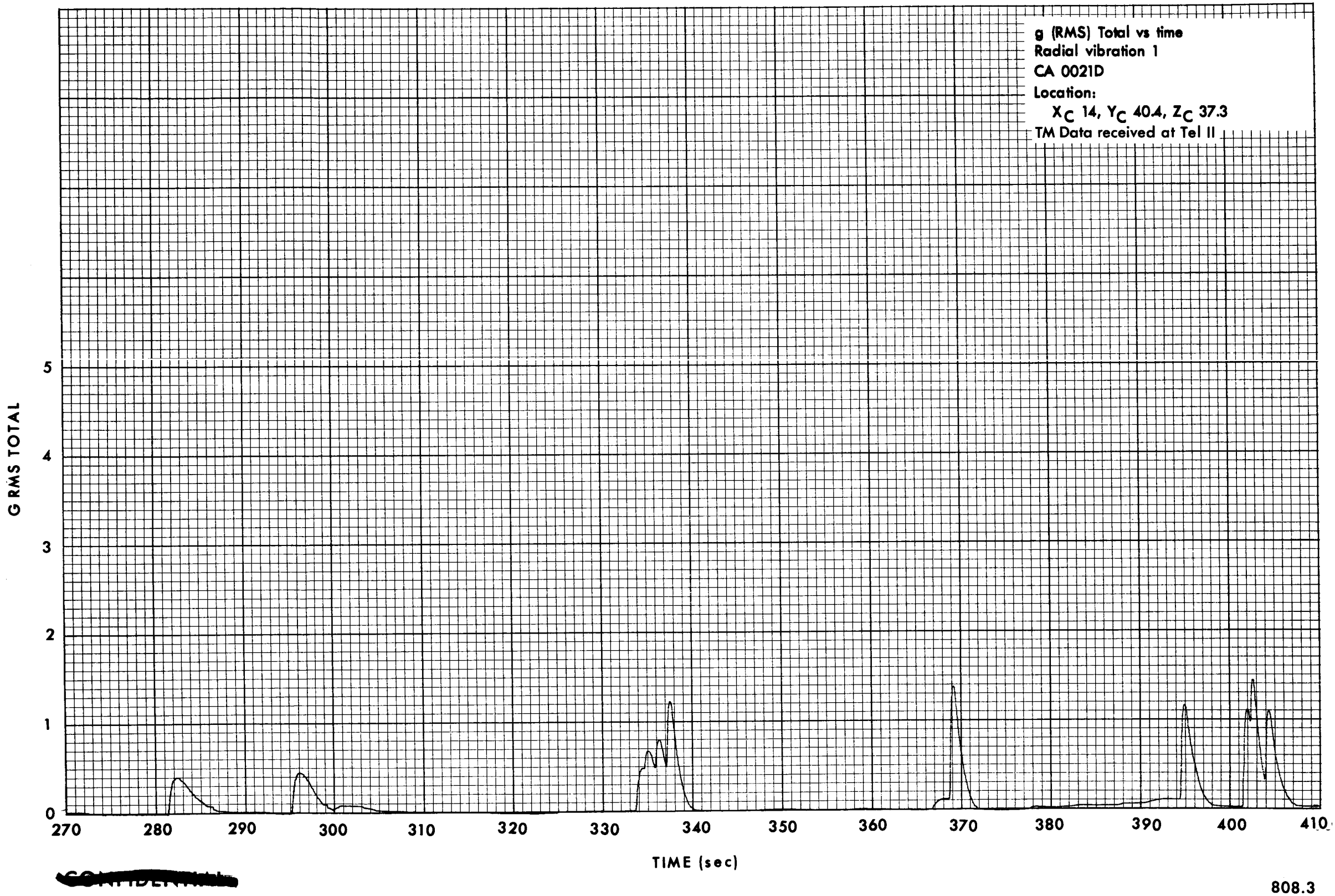

g (RMS) Total vs time
Y axis spacecraft accelerometer - SM
SA 0004
Location: X_A 866, Y_A 0, Z_A 73
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
Signal read zero remainder of powered flight
G RMS TOTAL
0
.1
.2
.3
.4
.5
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)


g (RMS) Total vs time
Radial vibration 1
CA 0021D
Location:
X_C 14, Y_C 40.4, Z_C 37.3
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
GRMS TOTAL
0
1
2
3
4
5
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)


g (RMS) Total vs time
Radial vibration 1
CA 0021D
Location:
X_C 14, Y_C 40.4, Z_C 37.3
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
G RMS TOTAL
0
1
2
3
4
5
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

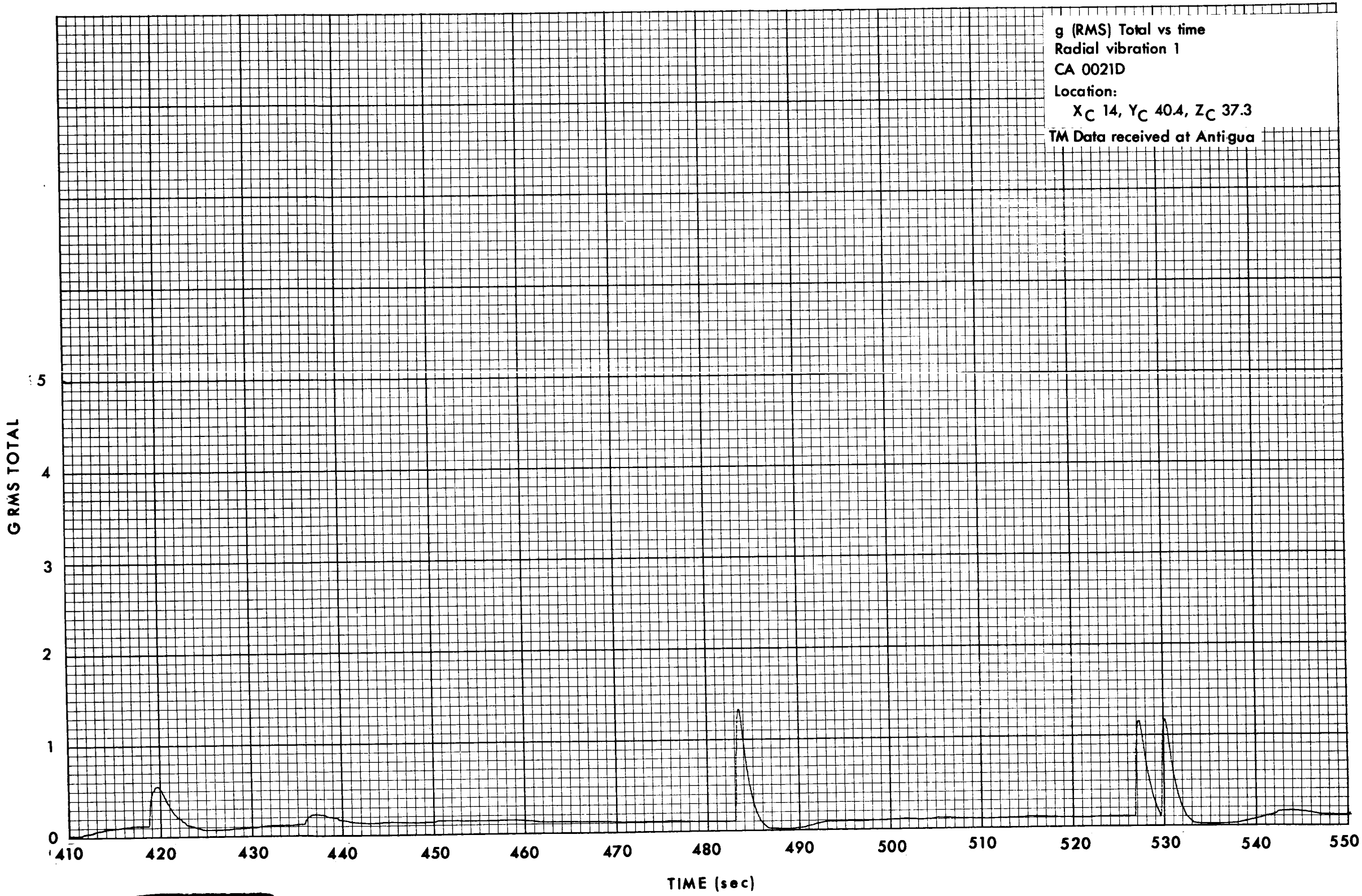
[redacted]

g (RMS) Total vs time
Radial vibration 1
CA 0021D
Location:
X_C 14, Y_C 40.4, Z_C 37.3
TM Data received at Tel II



[redacted]

g (RMS) Total vs time
Radial vibration 1
CA 0021D
Location:
X_C 14, Y_C 40.4, Z_C 37.3
TM Data received at Antigua



808.4

CONFIDENTIAL

g (RMS) Total vs time
Radial vibration 1
CA 0021D
Location:
X_C 14, Y_C 40.4, Z_C 37.3
TM Data received at Antigua

G RMS TOTAL

0 1 2 3 4 5

S-IV Cut-off

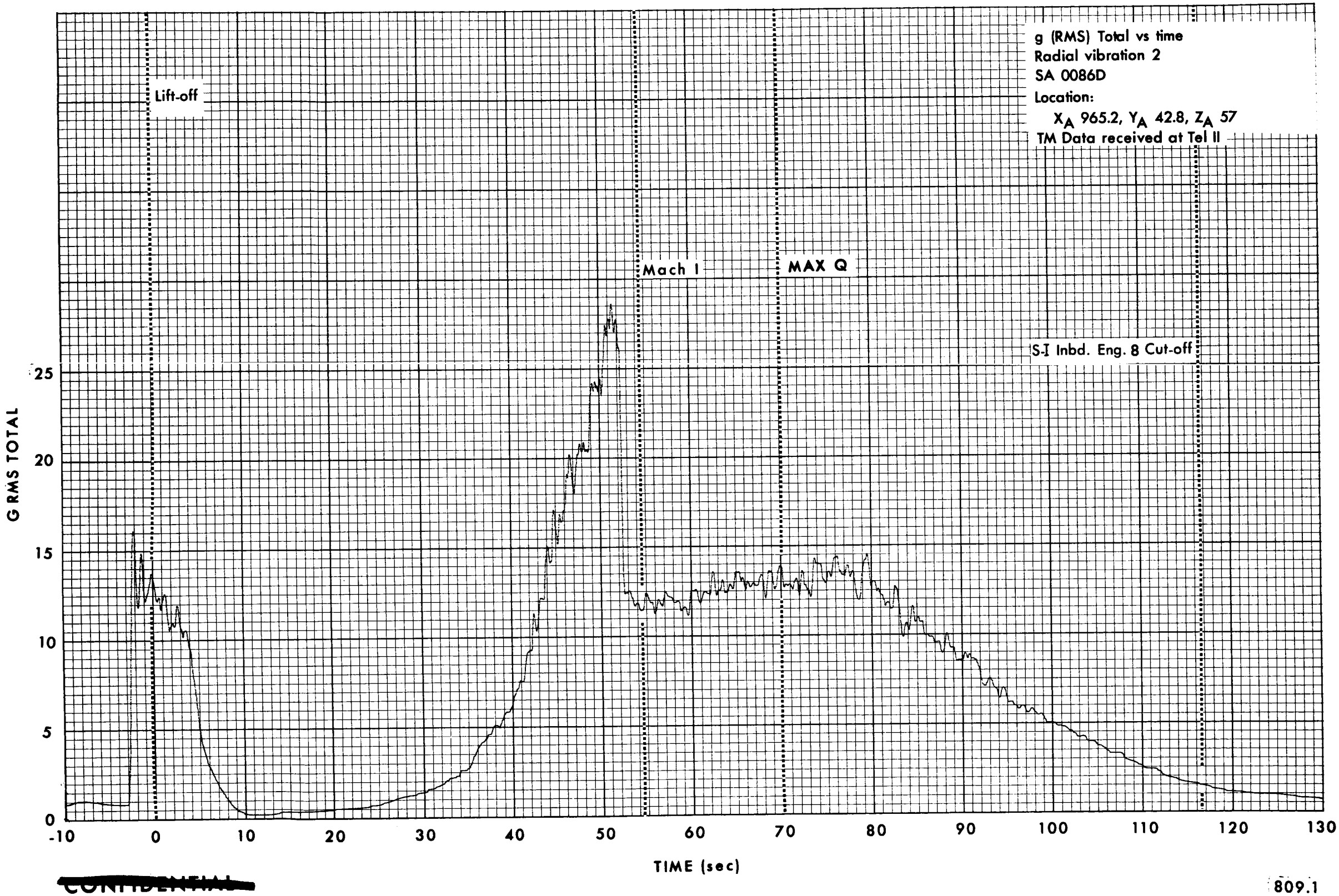
Orbit Insertion

550 560 570 580 590 600 610 620 630 640 650 660 670 680 690

TIME (sec)

CONFIDENTIAL

808.5


g (RMS) Total vs time
Radial vibration 2
SA 0086D
Location:
X_A 965.2, Y_A 42.8, Z_A 57
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
G RMS TOTAL
0
5
10
15
20
25
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

g (RMS) Total vs time
Radial vibration 2
SA 0086D
Location:
X_A 965.2, Y_A 42.8, Z_A 57
TM Data recevied at Tel II

S-IV Ignition
S-I Inbd.
Eng. Cut-off
S-I
Cut-off
Tower Jettison
Data invalid

G RMS TOTAL

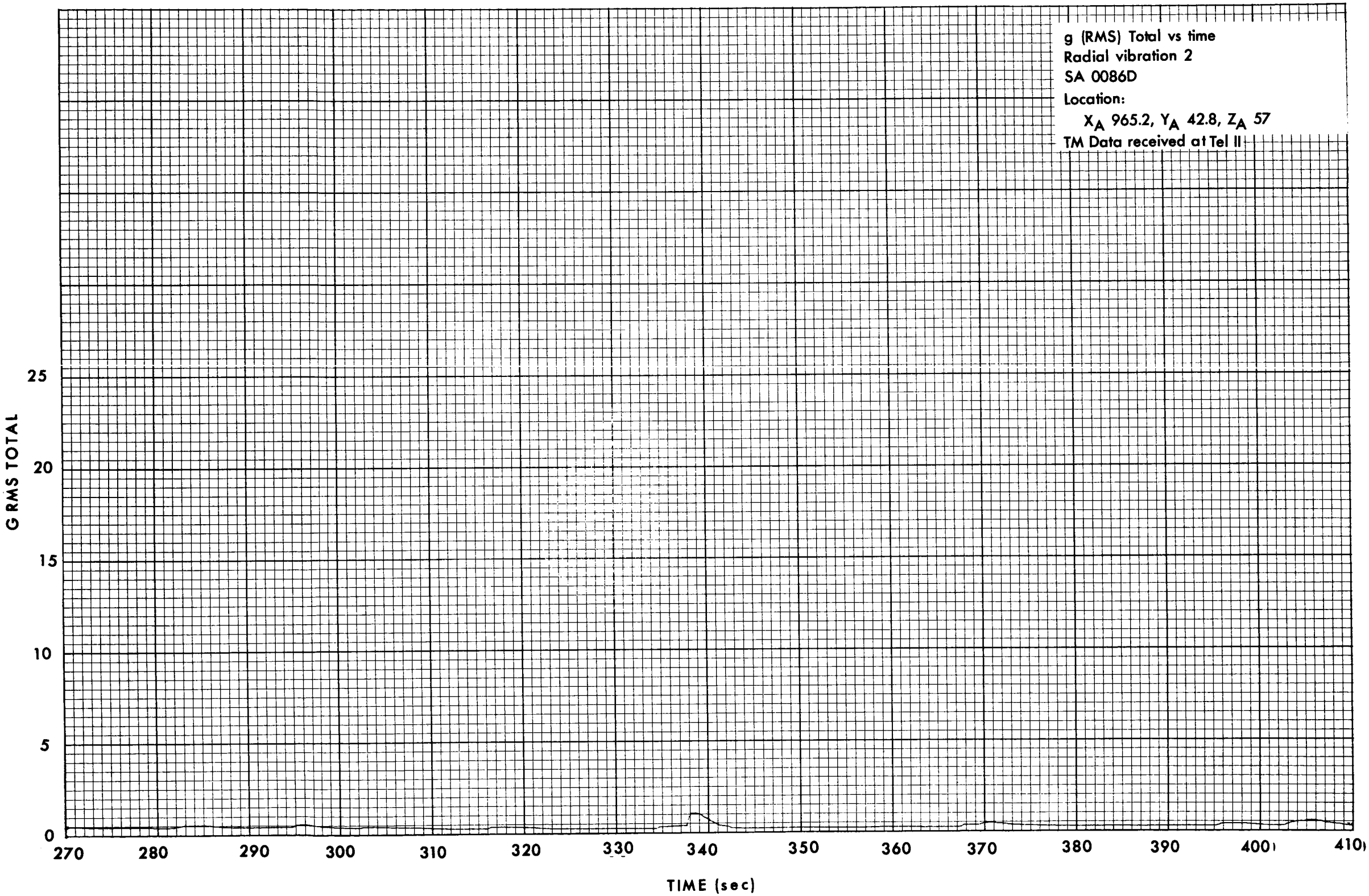
25
20
15
10
5
0

130 140 150 160 170 180 190 200 210 220 230 240 250 260 270

TIME (sec)

[redacted]

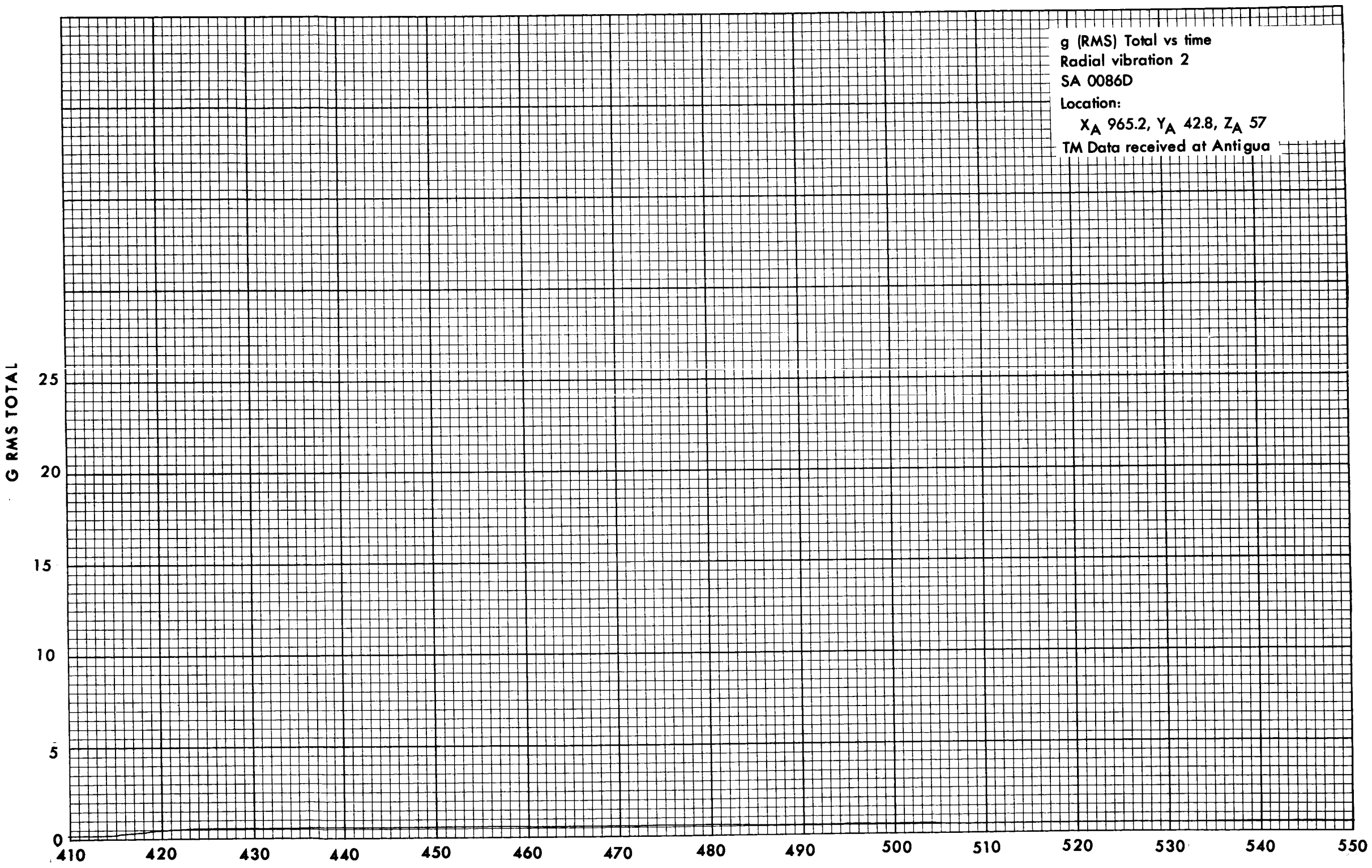
g (RMS) Total vs time
Radial vibration 2
SA 0086D
Location:
X_A 965.2, Y_A 42.8, Z_A 57
TM Data received at Tel II



[redacted]

809.3

~~CONFIDENTIAL~~



~~CONFIDENTIAL~~

809.4

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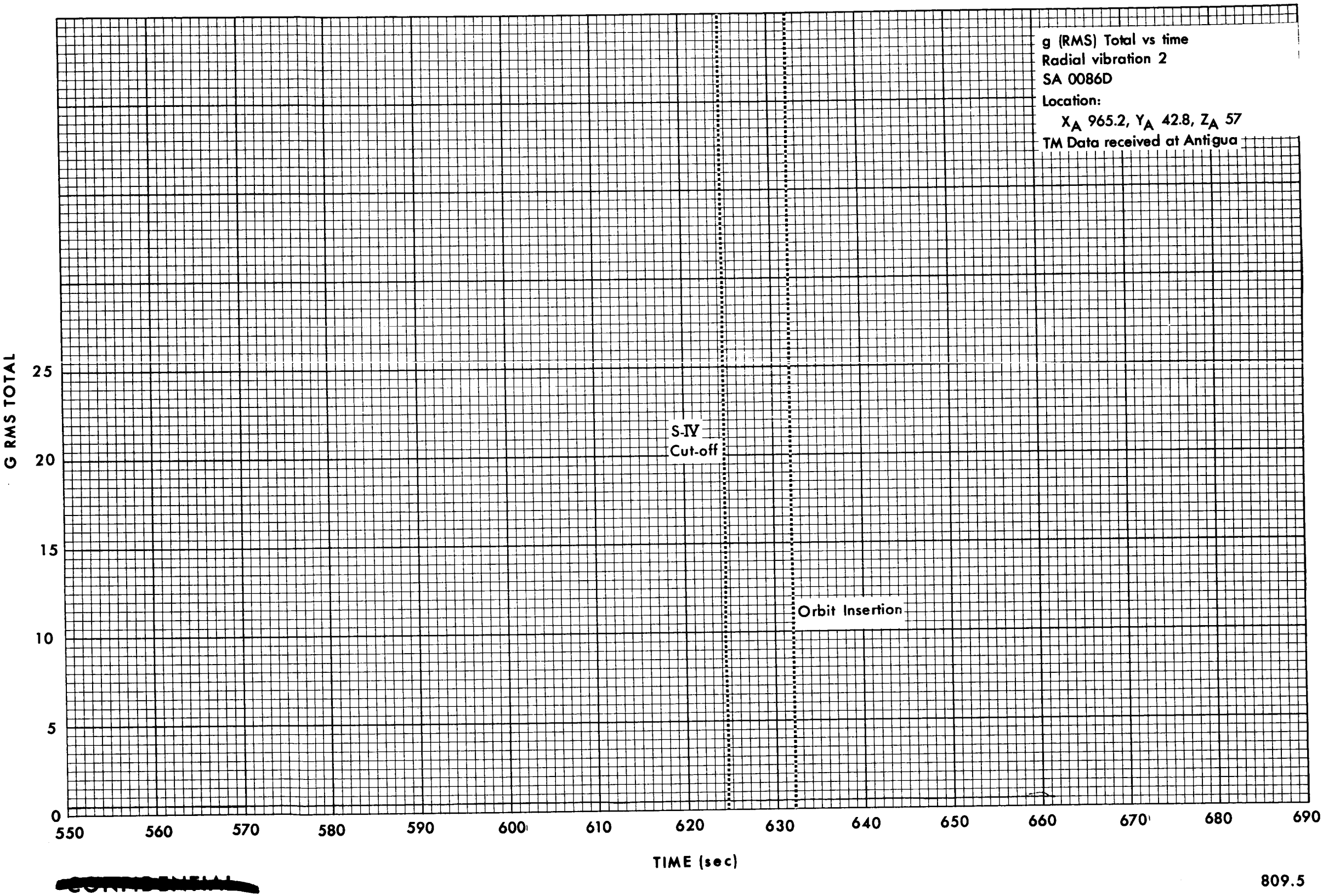

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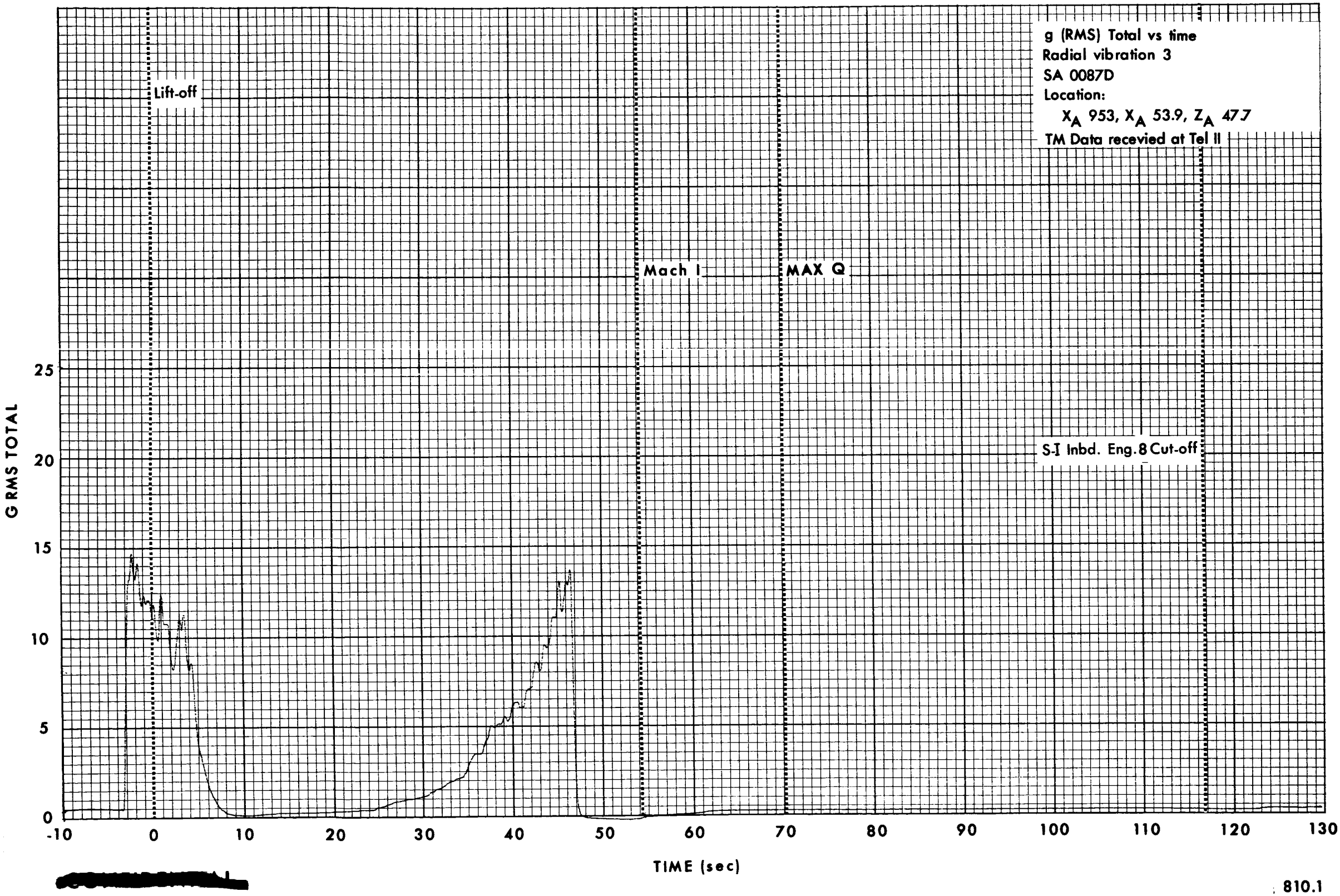
809.5

[redacted]



[redacted]

[redacted]

g (RMS) Total vs time
Radial vibration 3
SA 0087D
Location:
X_A 953, X_A 53.9, Z_A 477
TM Data recevied at Tel II

S-IV Ignition

S-I Inbd.
Eng. Cut-off

Tower Jettison

S-I
Cut-off

→ ← Data invalid

G RMS TOTAL

25
20
15
10
5
0

130 140 150 160 170 180 190 200 210 220 230 240 250 260 270

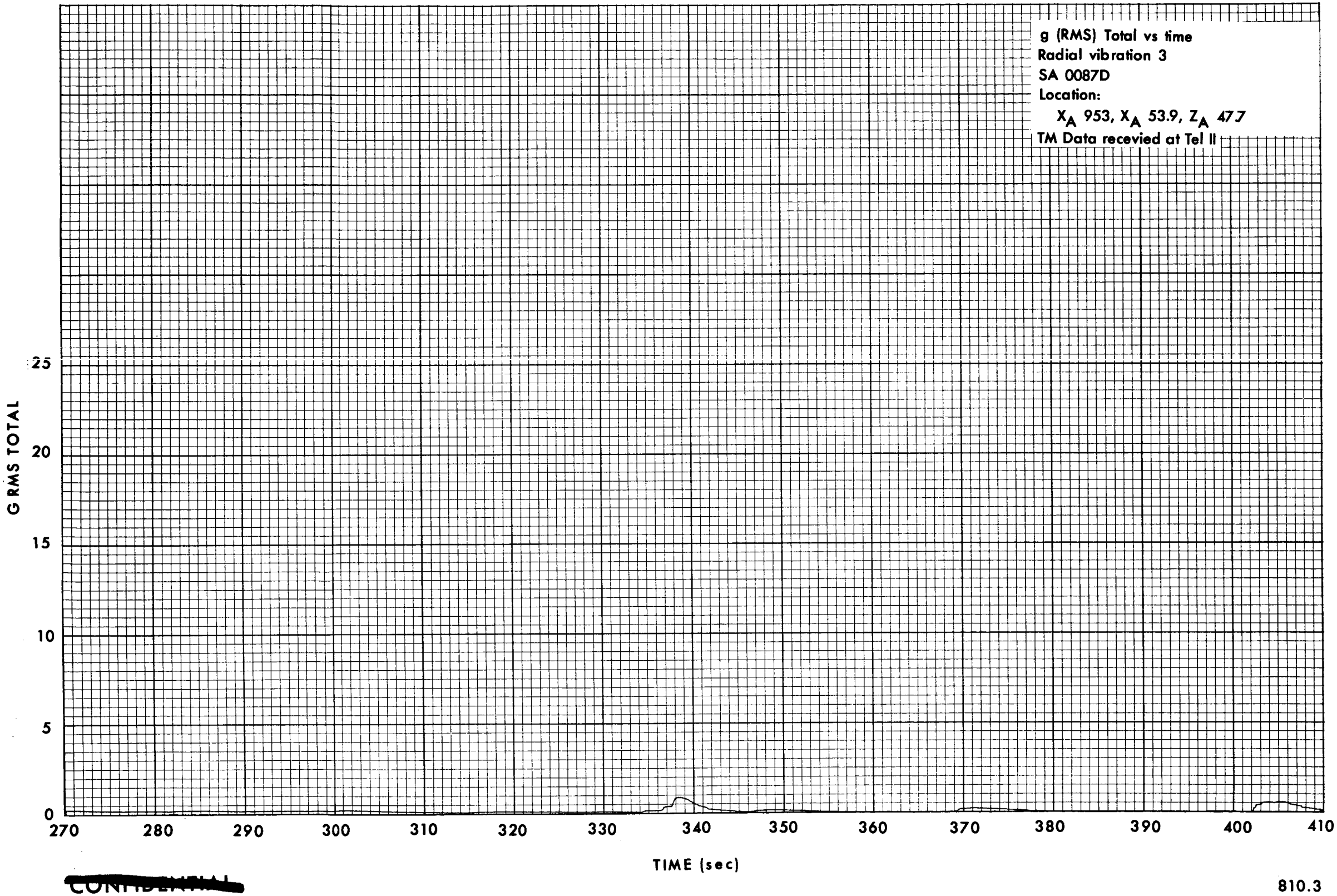
TIME (sec)

[redacted]

810.2

[redacted]

g (RMS) Total vs time
Radial vibration 3
SA 0087D
Location:
X_A 953, X_A 53.9, Z_A 47.7
TM Data recevied at Tel II



[redacted]

[redacted]

PSD g^2/cps vs frequency
Radial vibration 3
SA 0087D
Location:
X_A 953, X_A 53.9, Z_A 477
TM Data received at Antigua

G RMS TOTAL

25
20
15
10
5
0

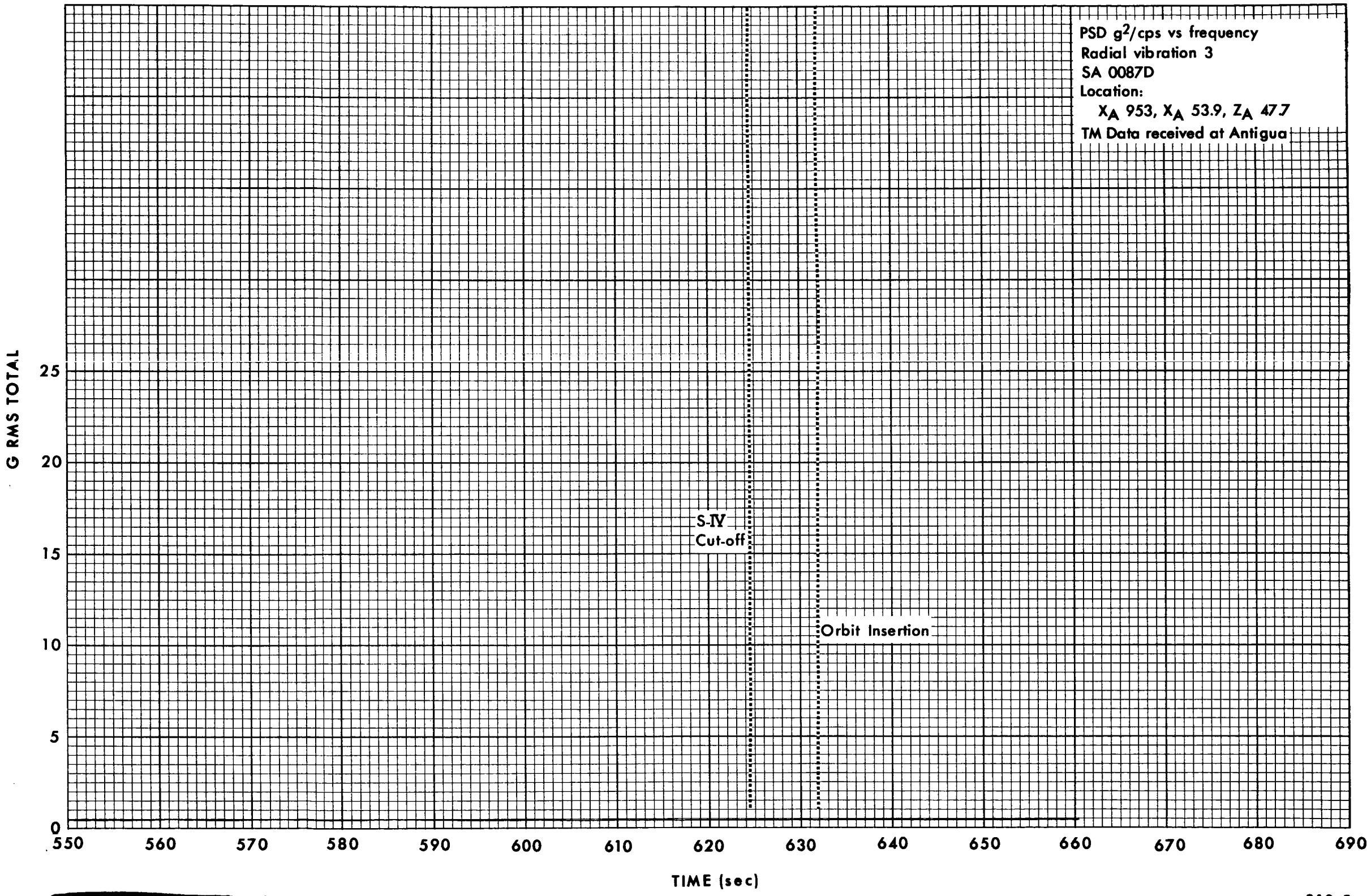
410 420 430 440 450 460 470 480 490 500 510 520 530 540 550

TIME (sec)

810.4

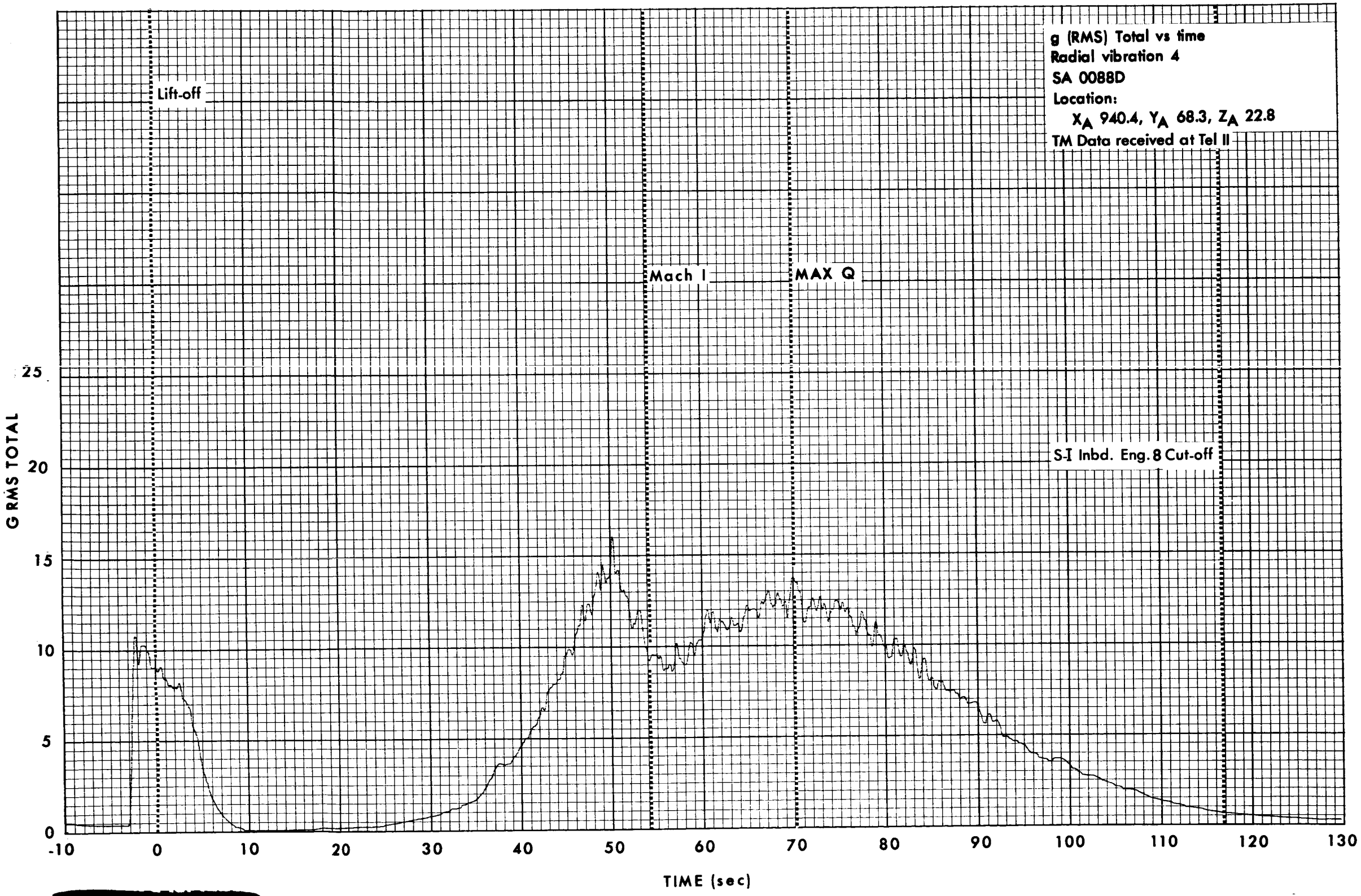
[redacted]

CONFIDENTIAL



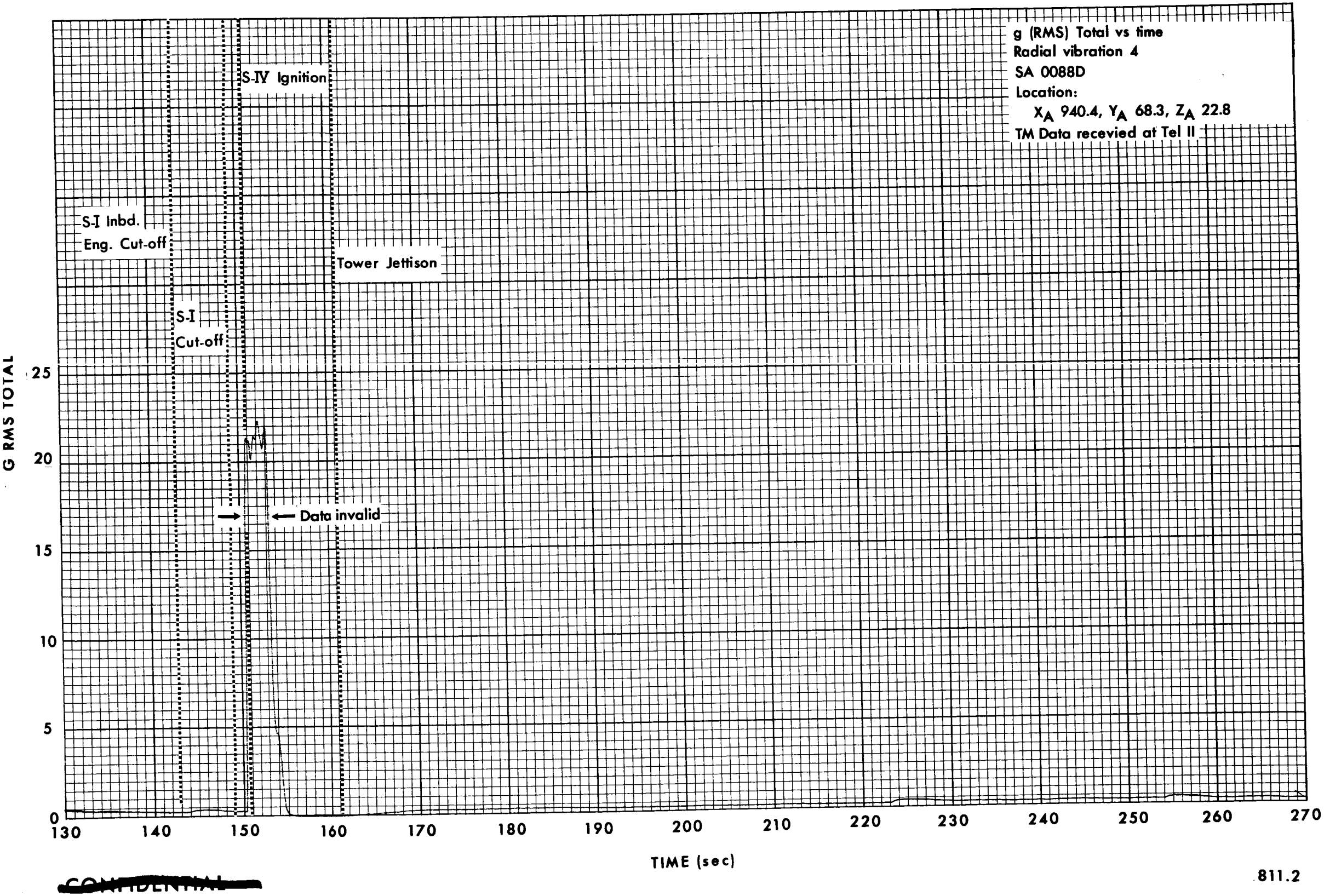
CONFIDENTIAL

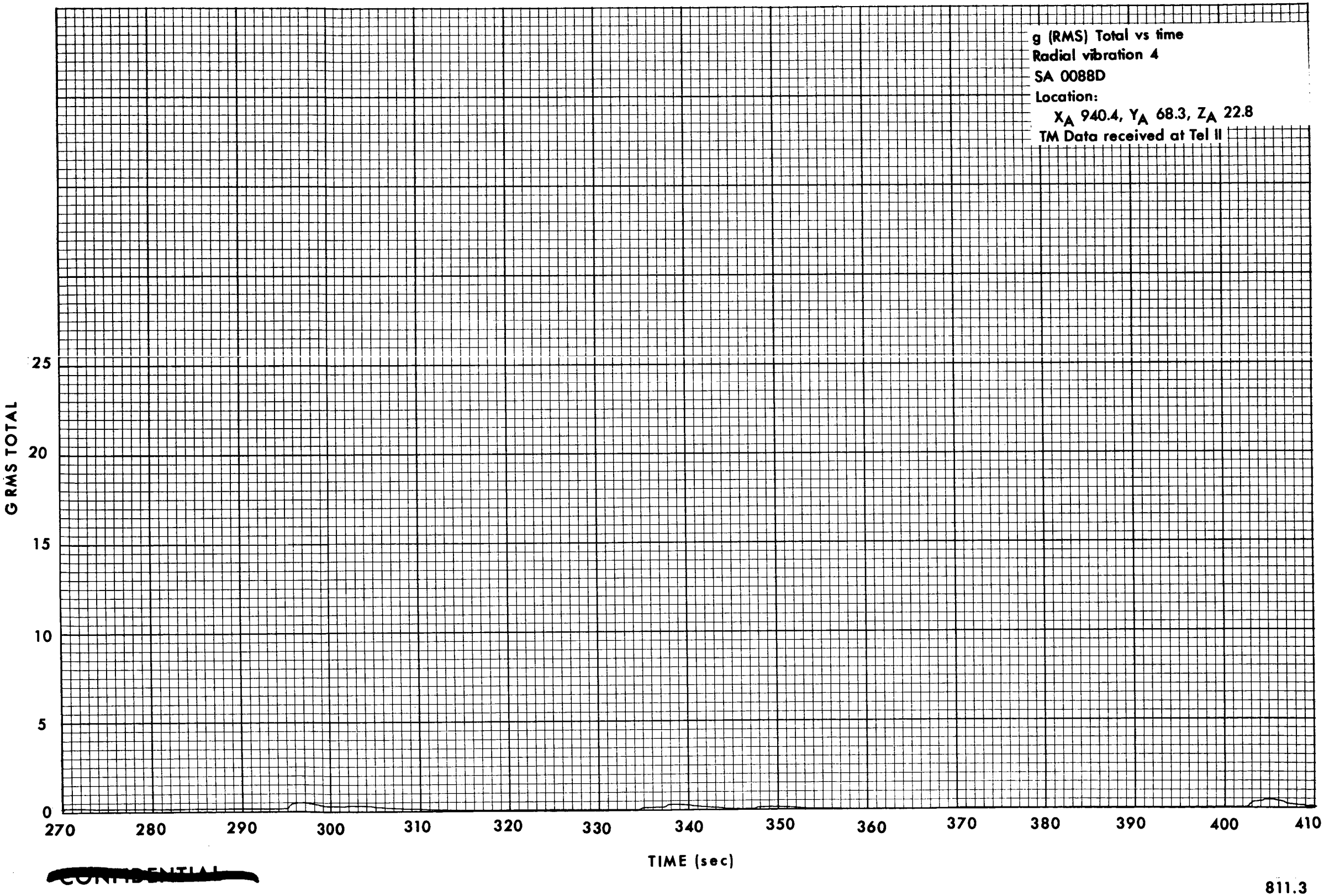
CONFIDENTIAL



CONFIDENTIAL

811.1


g (RMS) Total vs time
Radial vibration 4
SA 0088D
Location:
X_A 940.4, Y_A 68.3, Z_A 22.8
TM Data recevied at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
G RMS TOTAL
0
5
10
15
20
25
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)


g (RMS) Total vs time
Radial vibration 4
SA 0088D
Location:
X_A 940.4, Y_A 68.3, Z_A 22.8
TM Data received at Tel II
G RMS TOTAL
0
5
10
15
20
25
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)

[redacted]

g (RMS) Total vs time
Radial vibration 4
SA 0088D
Location:
X_A 940.4, Y_A 68.3, Z_A 22.8
TM Data received at Antigua

G RMS TOTAL

25
20
15
10
5
0

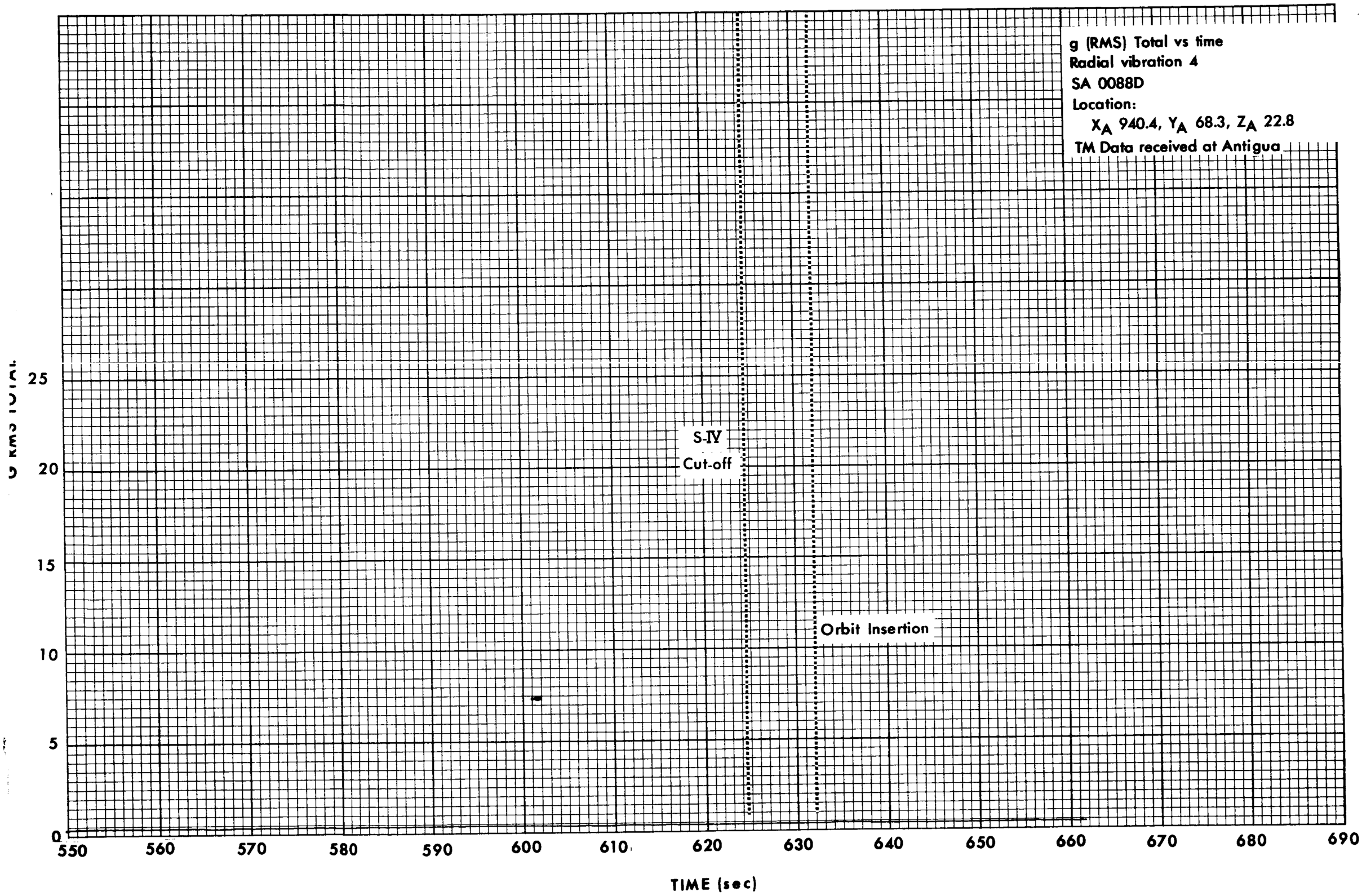
410 420 430 440 450 460 470 480 490 500 510 520 530 540 550

TIME (sec)

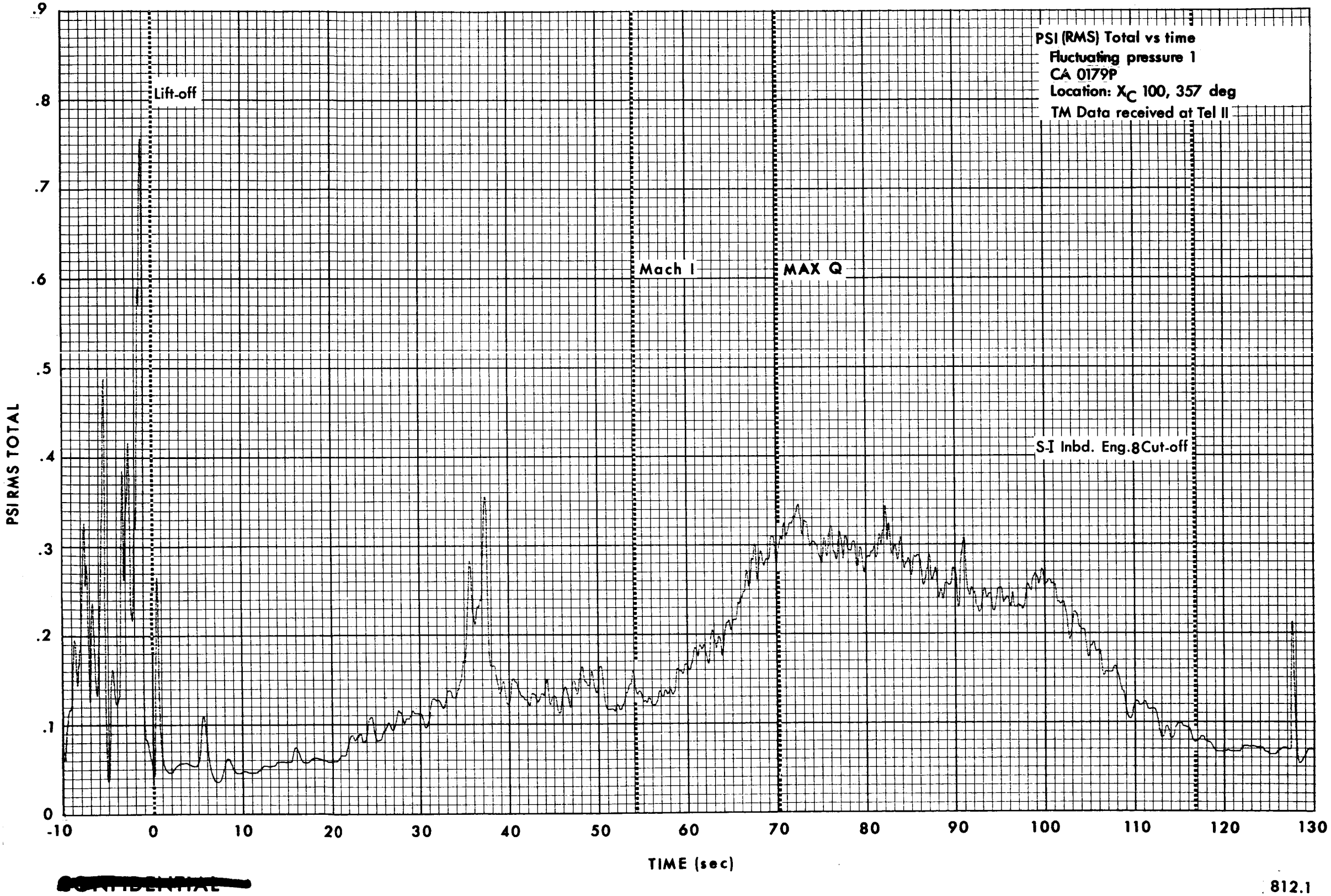
[redacted]

811.4

[redacted]



[redacted]


PSI (RMS) Total vs time
Fluctuating pressure 1
CA 0179P
Location: X_C 100, 357 deg
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng.8Cut-off
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

PSI (RMS) Total vs time
Fluctuating pressure 1
CA 0179P
Location: X_C 100, 357 deg
TM Data received at Tel II

S-IV Ignition
S-I Inbd. Eng. Cut-off
Tower Jettison
S-I Cut-off
← Data invalid

PSI RMS TOTAL

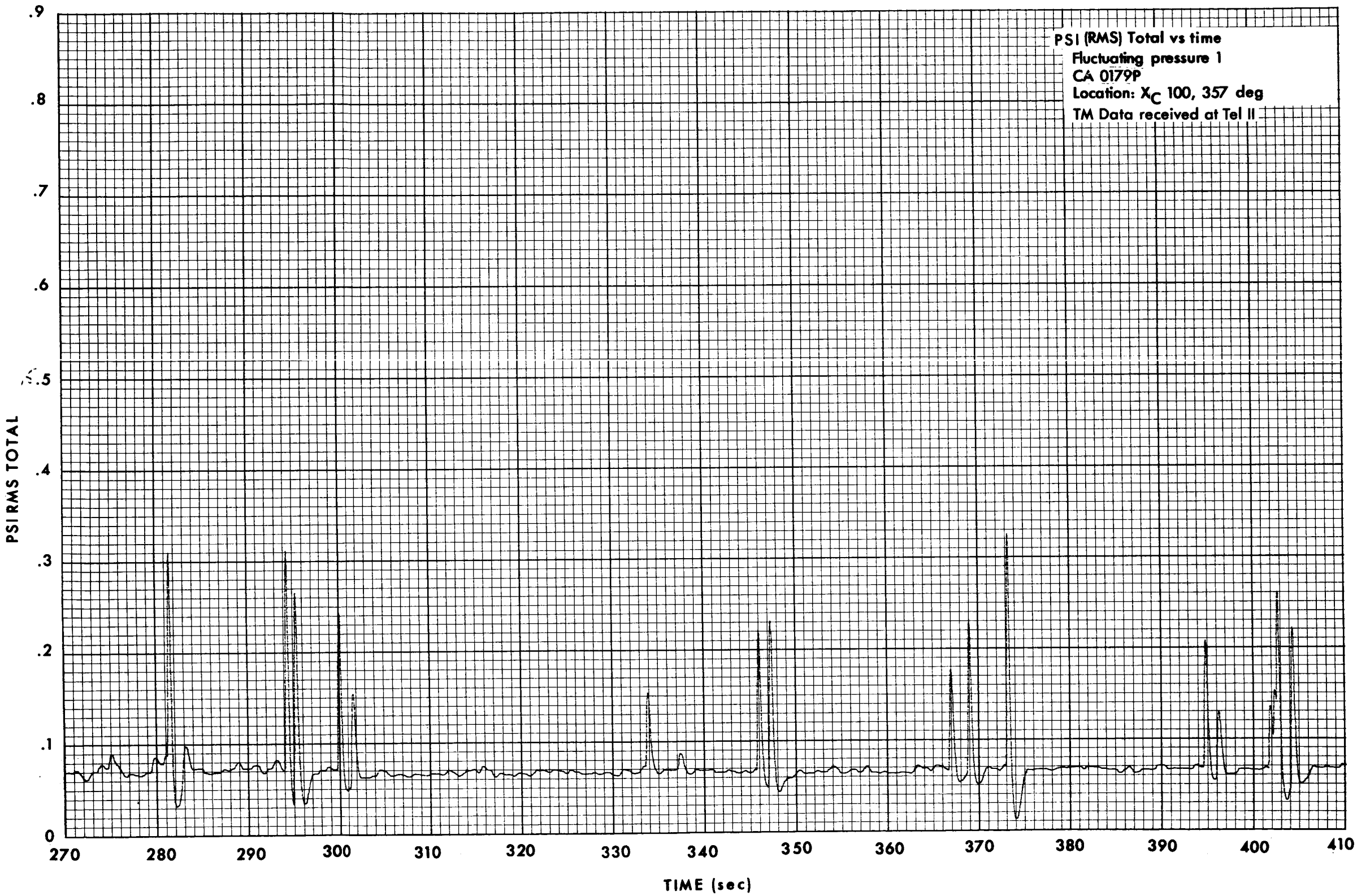
.9
.8
.7
.6
.5
.4
.3
.2
.1
0

130 140 150 160 170 180 190 200 210 220 230 240 250 260 270

TIME (sec)

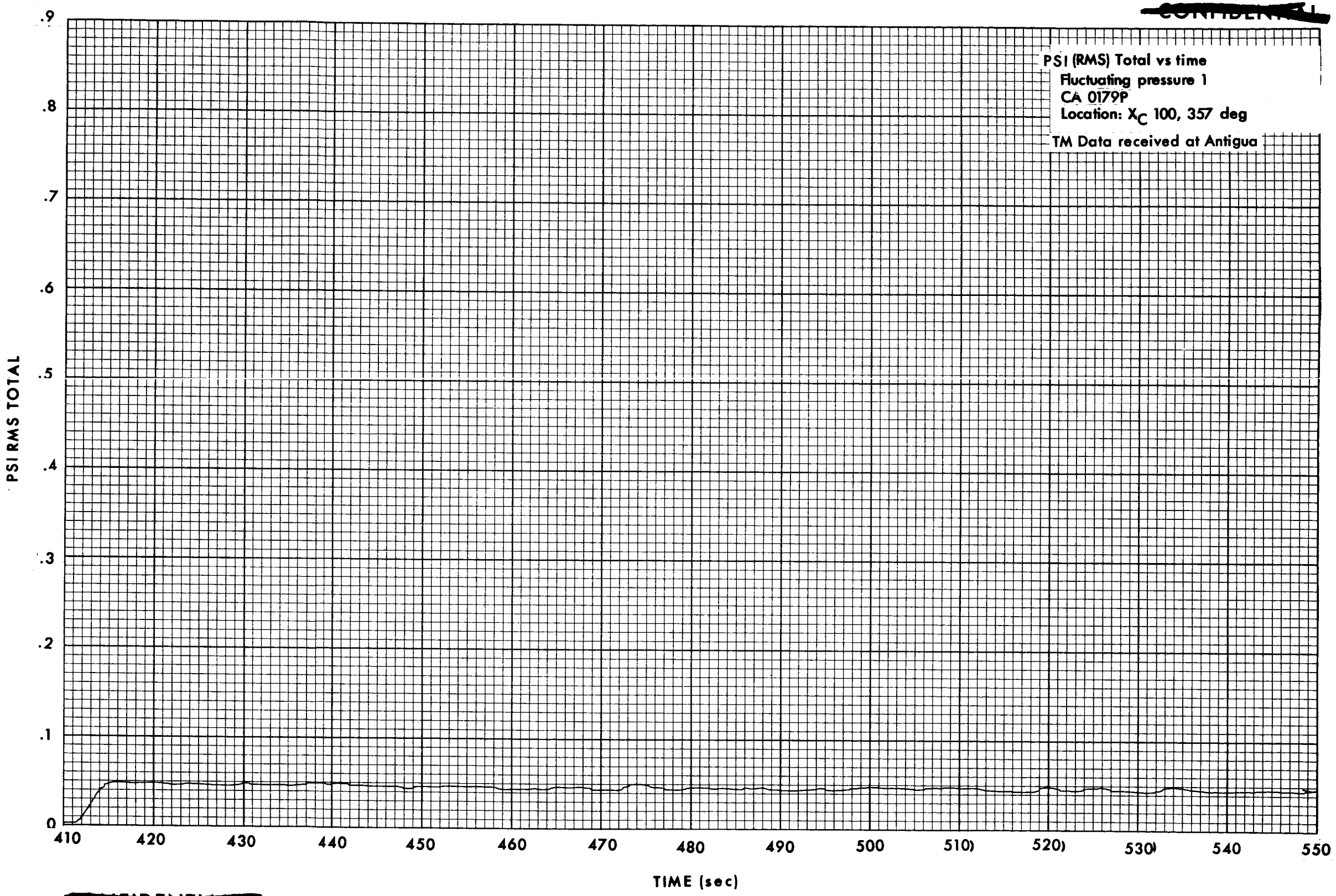
812.2

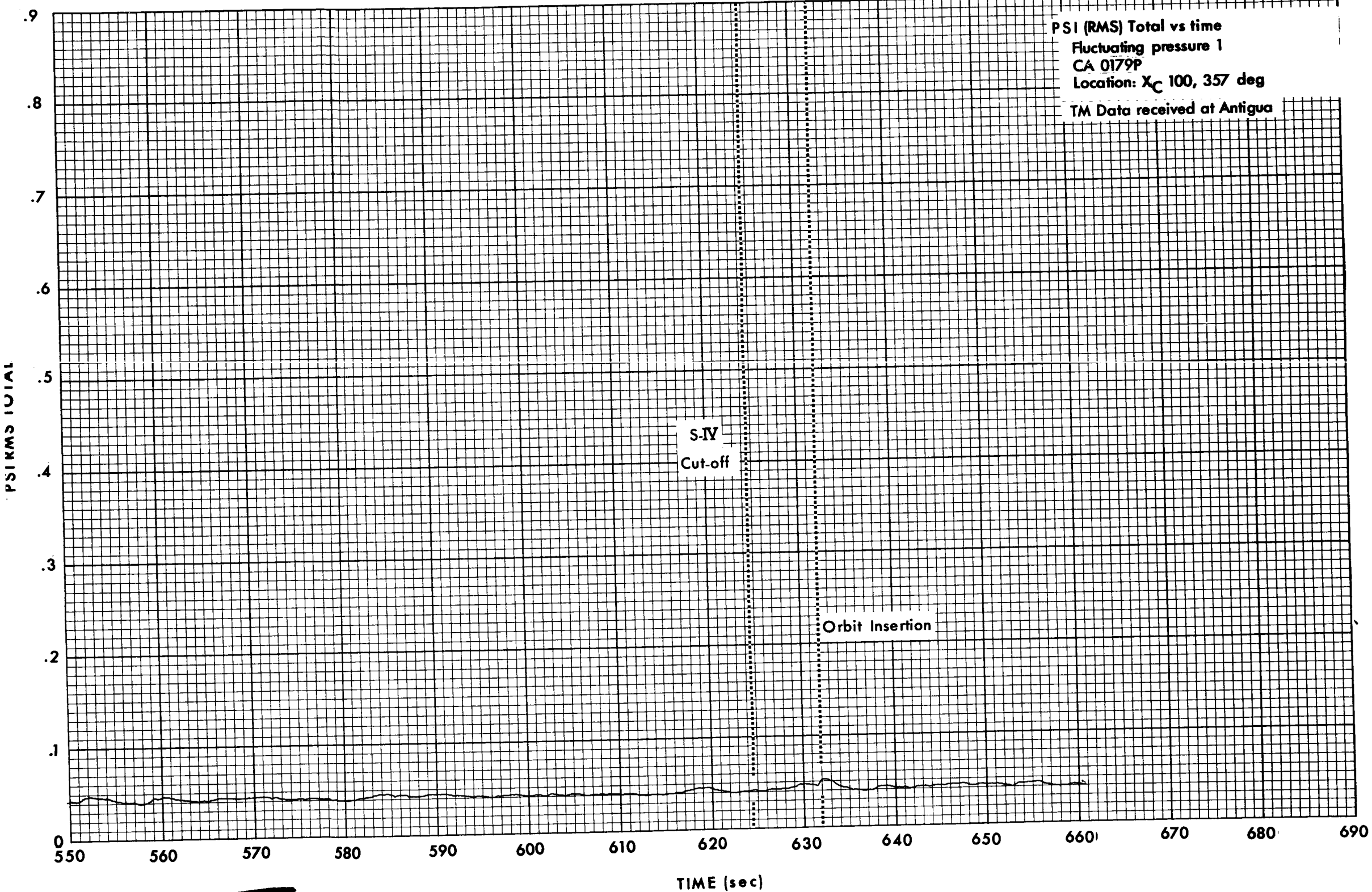
[redacted]



[redacted]

812.3


PSI (RMS) Total vs time
Fluctuating pressure 1
CA 0179P
Location: X_C 100, 357 deg
TM Data received at Antigua
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
410
420
430
440
450
460
470
480
490
500
510)
520)
530)
540
550
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 1
CA 0179P
Location: X_C 100, 357 deg
TM Data received at Antigua
PSI KMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
S-IV
Cut-off
Orbit Insertion
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690
TIME (sec)

PSI (RMS) Total vs time
Fluctuating pressure 2
CA 0180P
Location: X_C 70, 357 deg
TM Data received at Tel II

Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. & Cut-off

PSI RMS TOTAL

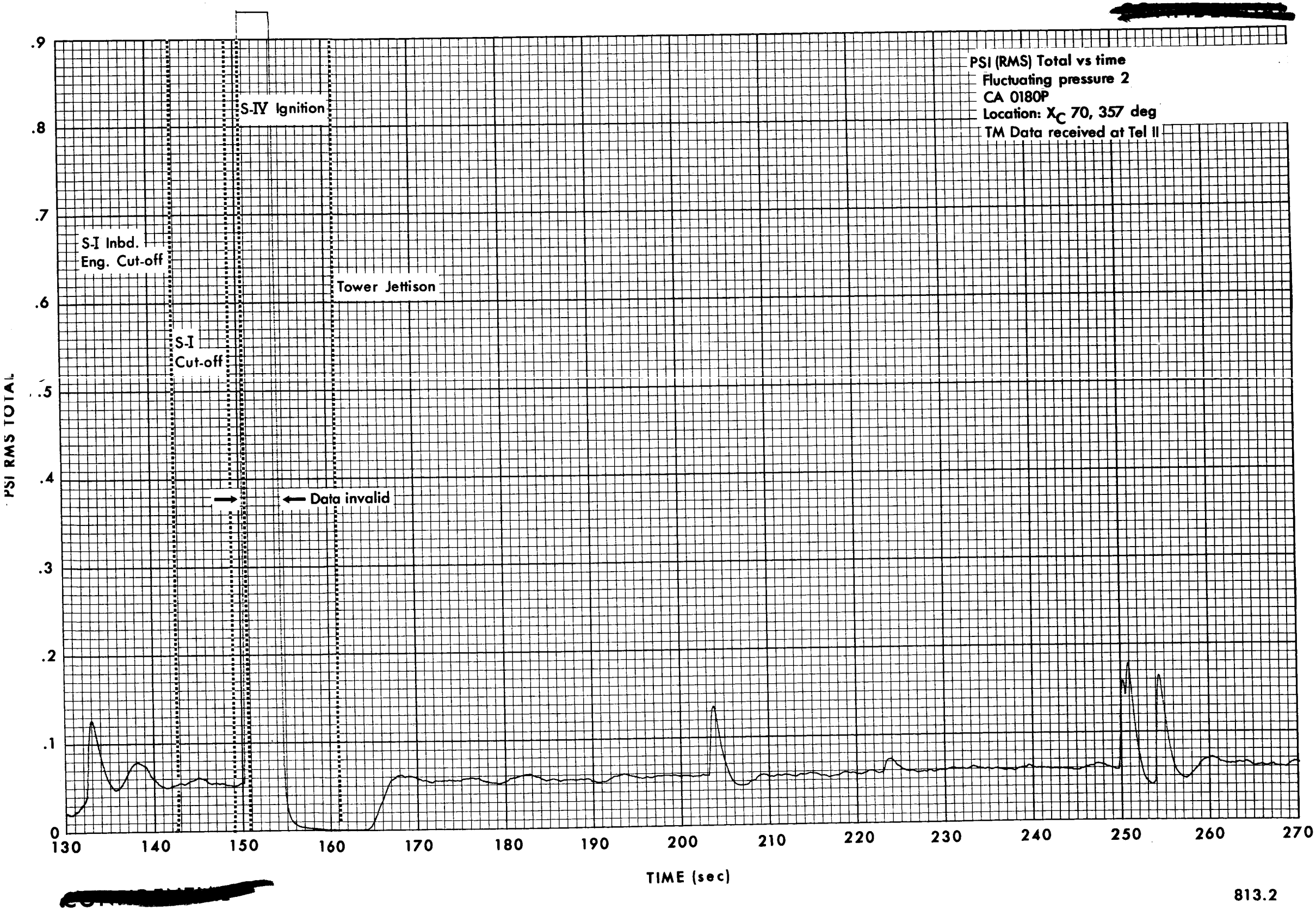
.9
.8
.7
.6
.5
.4
.3
.2
.1
0

-10 0 10 20 30 40 50 60 70 80 90 100 110 120 130

TIME (sec)

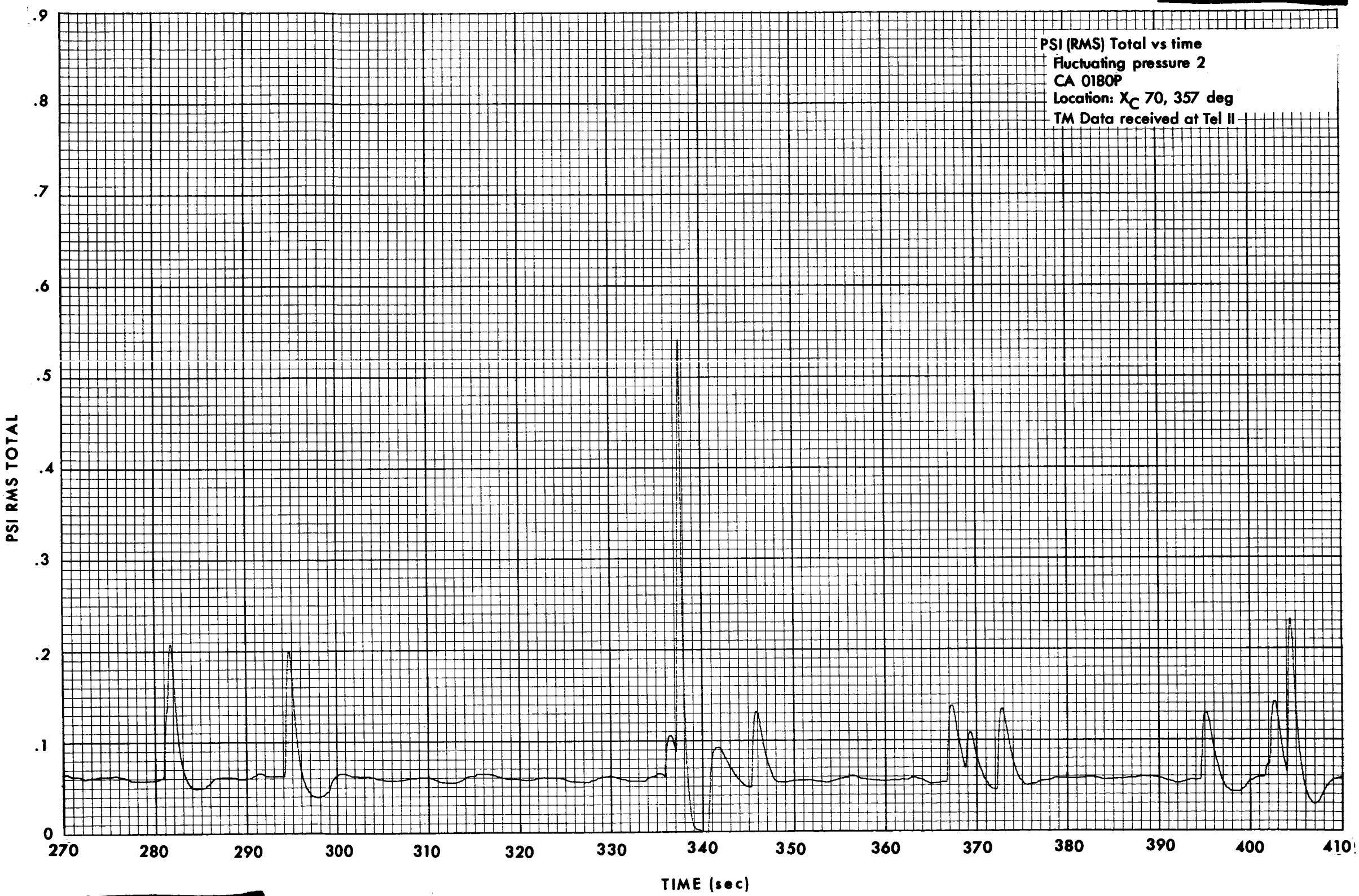
813.1

[redacted]



[redacted]

813.2


PSI (RMS) Total vs time
Fluctuating pressure 2
CA 0180P
Location: X_C 70, 357 deg
TM Data received at Tel II
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)

[redacted]

PSI (RMS) Total vs time
Fluctuating pressure 2
CA 0180P
Location: X_C 70, 357 deg
TM Data received at Antigua

PSI RMS TOTAL

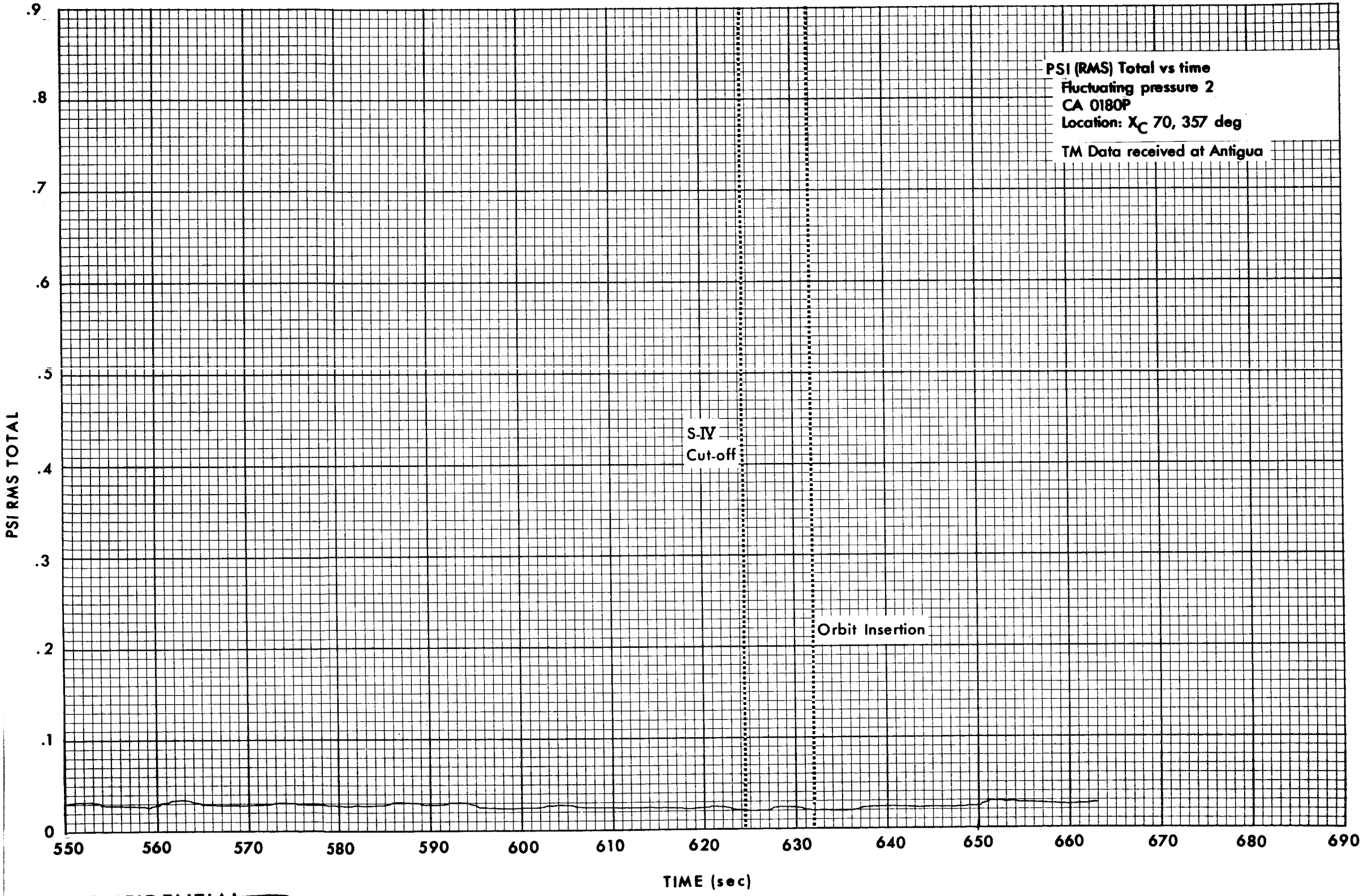
.9
.8
.7
.6
.5
.4
.3
.2
.1
0

410 420 430 440 450 460 470 480 490 500 510 520 530 540 550

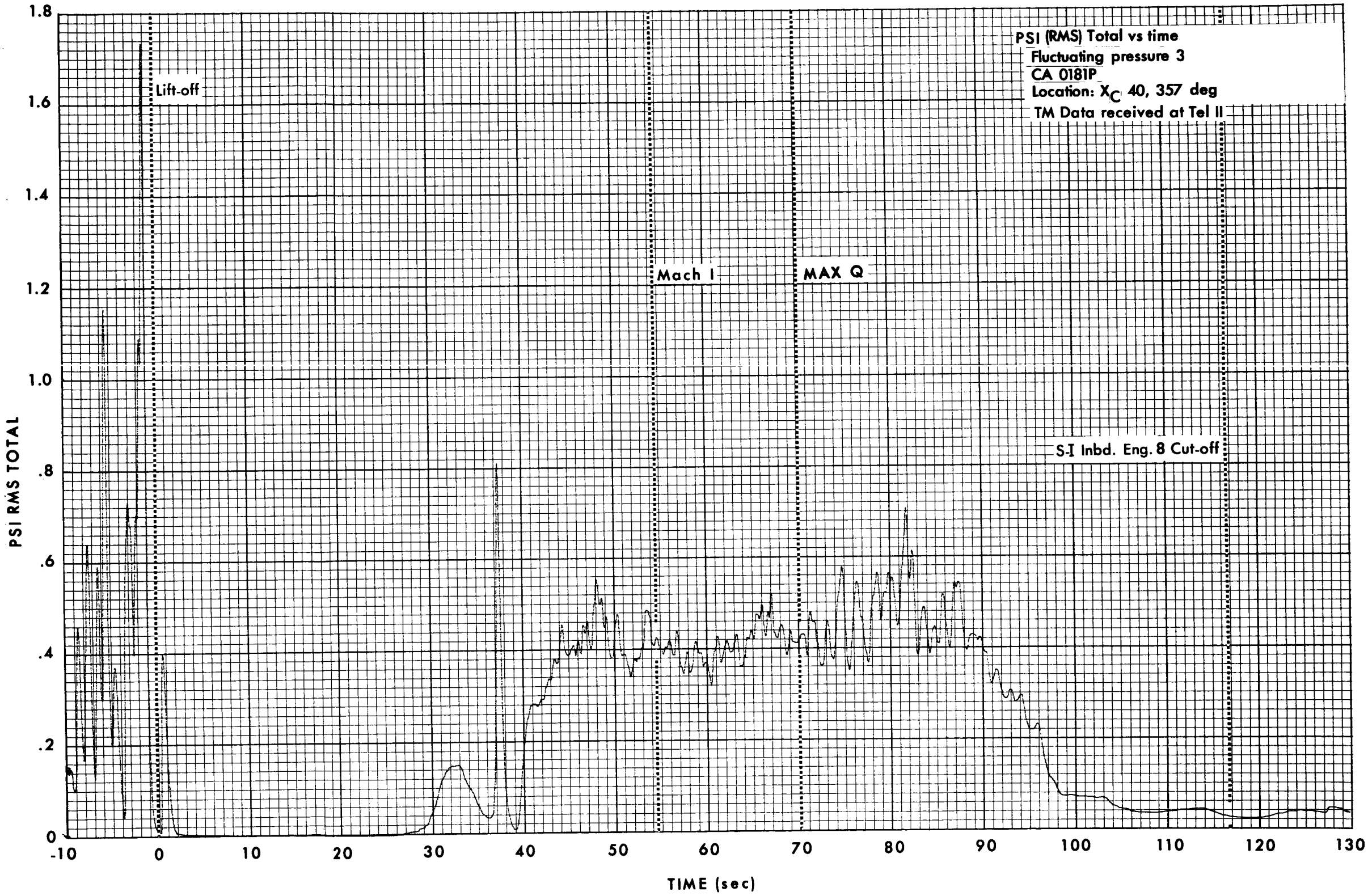
TIME (sec)

[redacted]

813.4

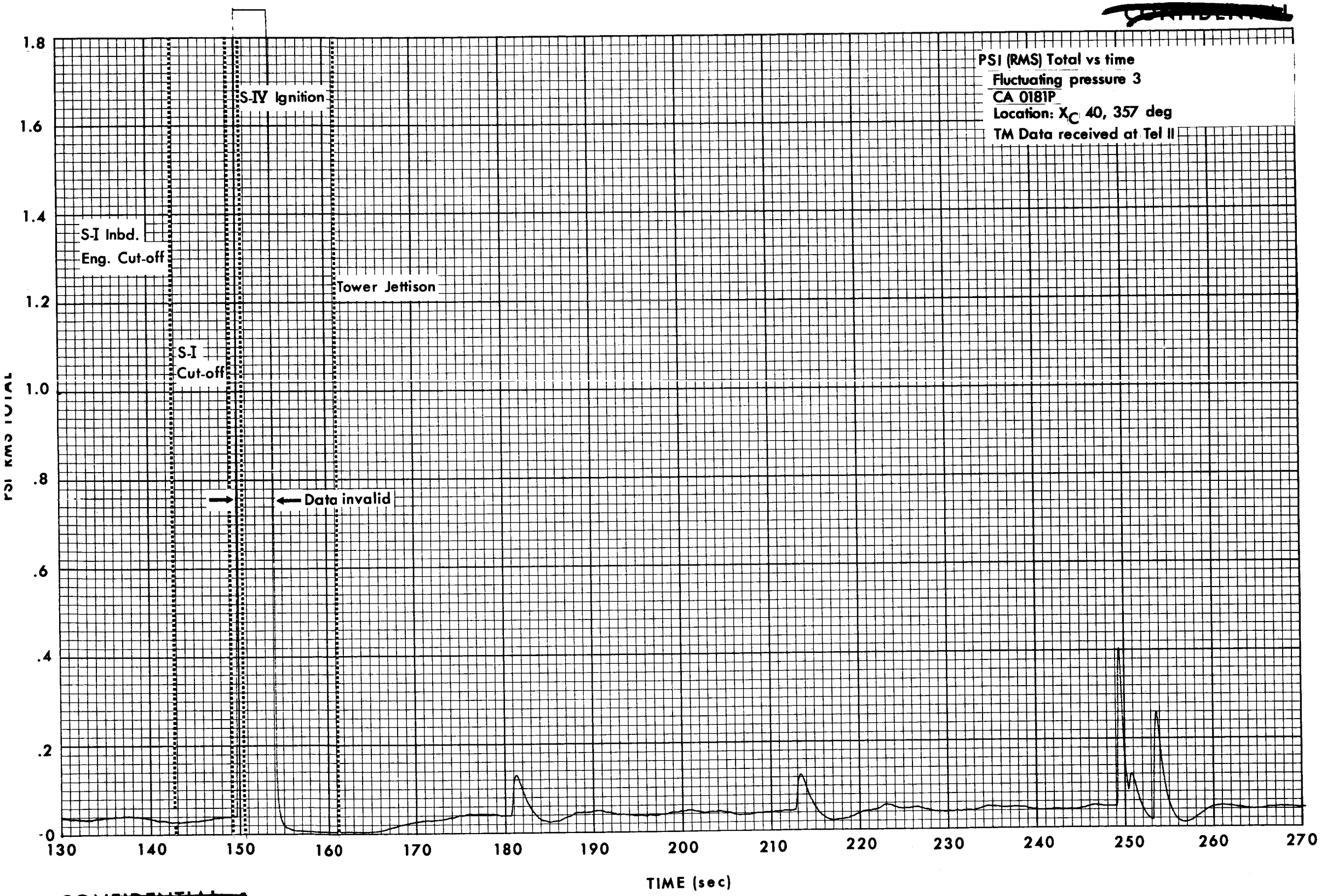

PSI (RMS) Total vs time
Fluctuating pressure 2
CA 0180P
Location: X_C 70, 357 deg
TM Data received at Antigua
S-IV Cut-off
Orbit Insertion
PSI RMS TOTAL
TIME (sec)
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690

CONFIDENTIAL

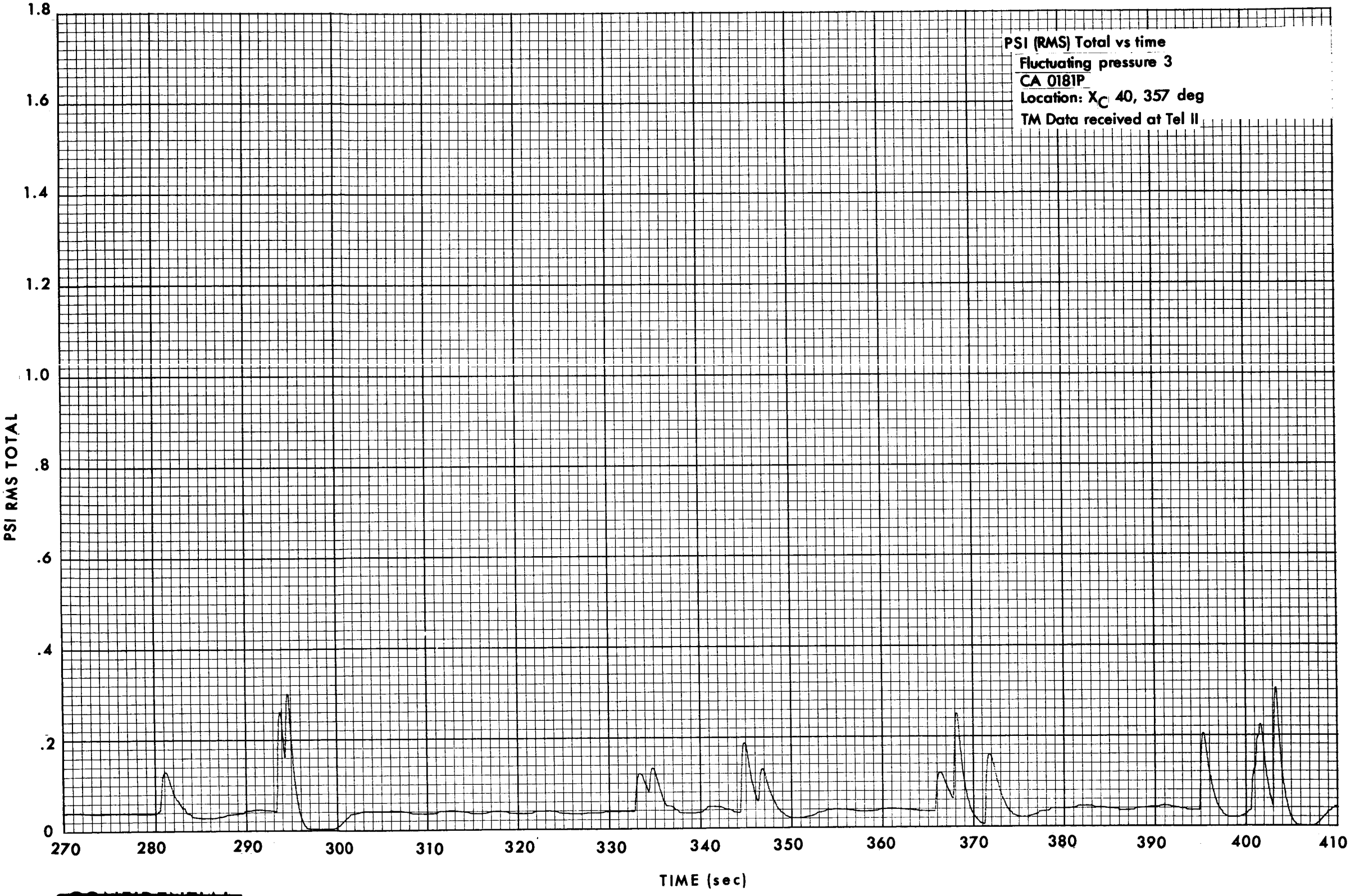


CONFIDENTIAL

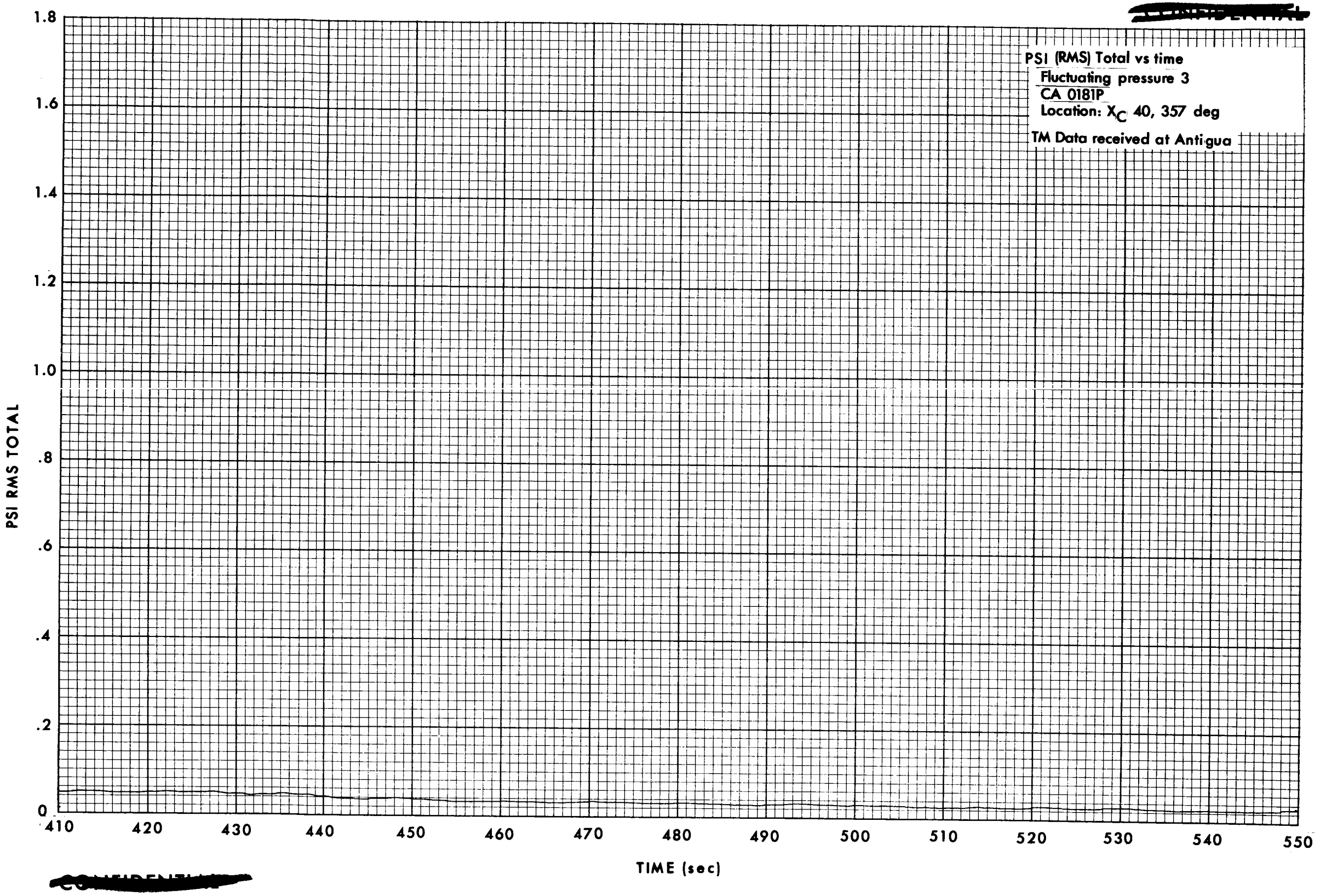
814.1


PSI (RMS) Total vs time
Fluctuating pressure 3
CA 0181P
Location: X_C 40, 357 deg
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

814.2


PSI (RMS) Total vs time
Fluctuating pressure 3
CA 0181P
Location: X_C 40, 357 deg
TM Data received at Tel II
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)

814.3


PSI (RMS) Total vs time
Fluctuating pressure 3
CA 0181P
Location: X_C 40, 357 deg
TM Data received at Antigua
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
410
420
430
440
450
460
470
480
490
500
510
520
530
540
550
TIME (sec)

CONFIDENTIAL

PSI (RMS) Total vs time
Fluctuating pressure 3
CA 0181P
Location: X_C 40, 357 deg

TM Data received at Antigua

PSI RMS TOTAL

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0

S-IV
Cut-off

Orbit Insertion

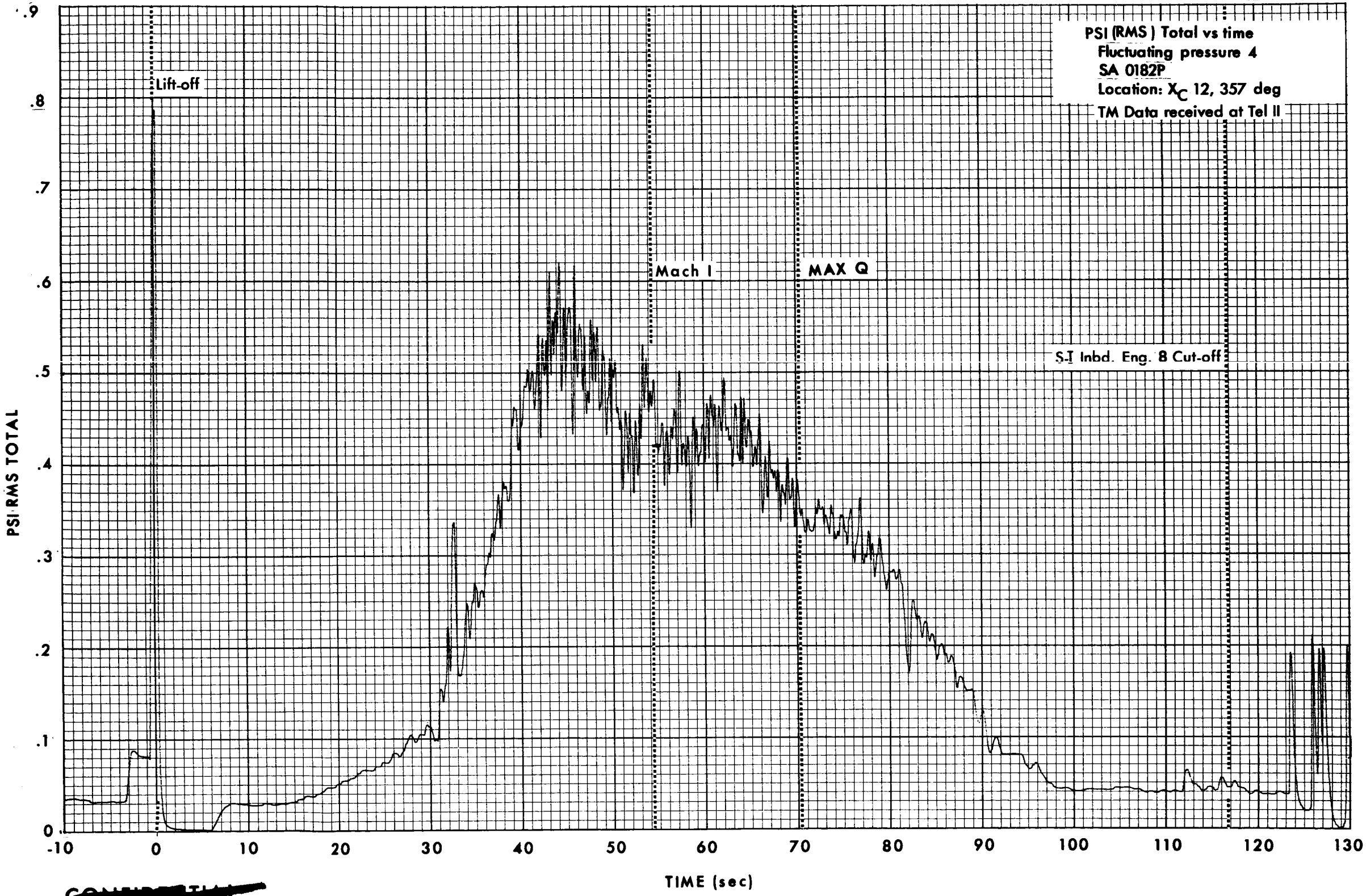
550 560 570 580 590 600 610 620 630 640 650 660 670 680 690

TIME (sec)

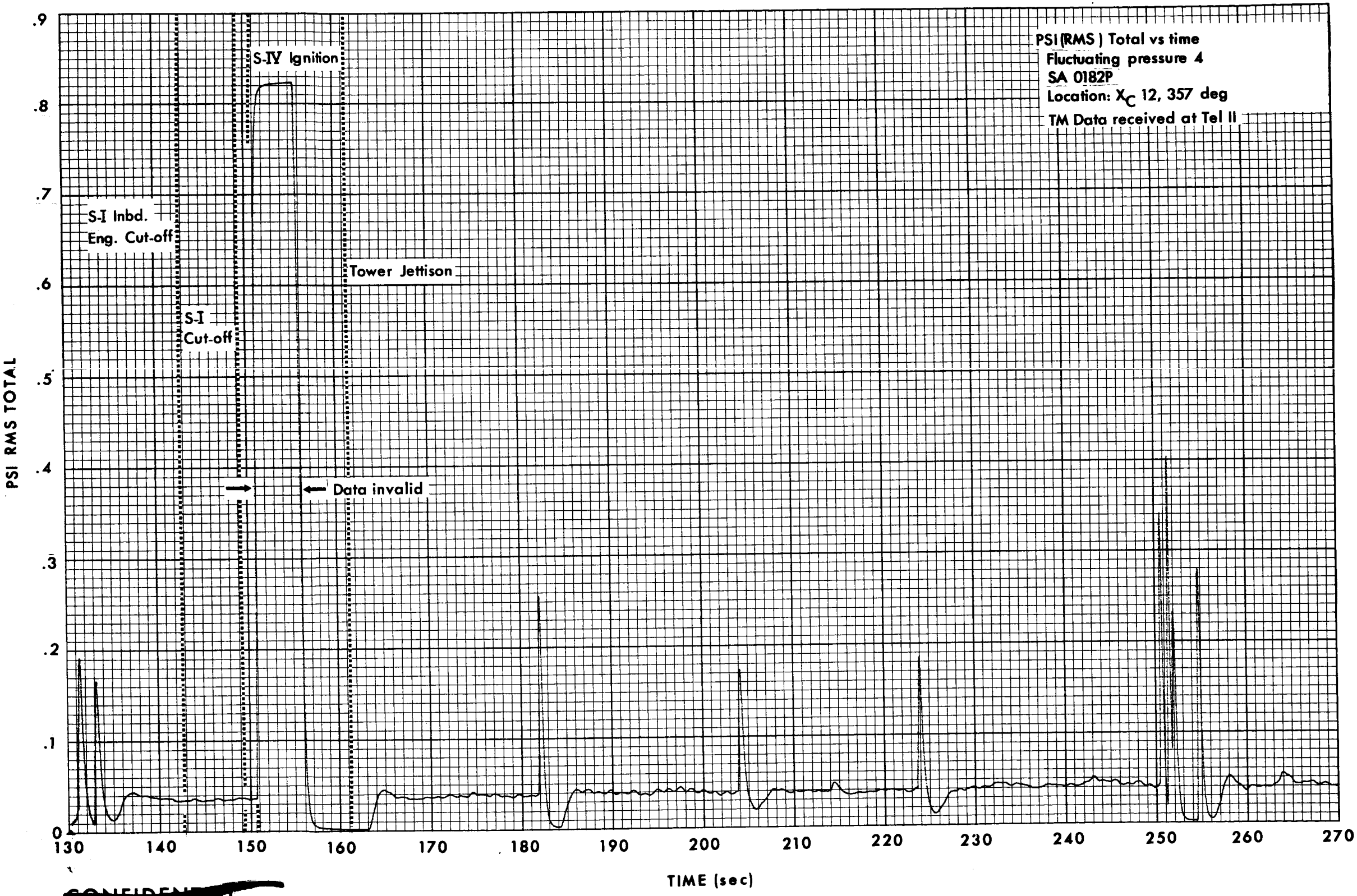
CONFIDENTIAL

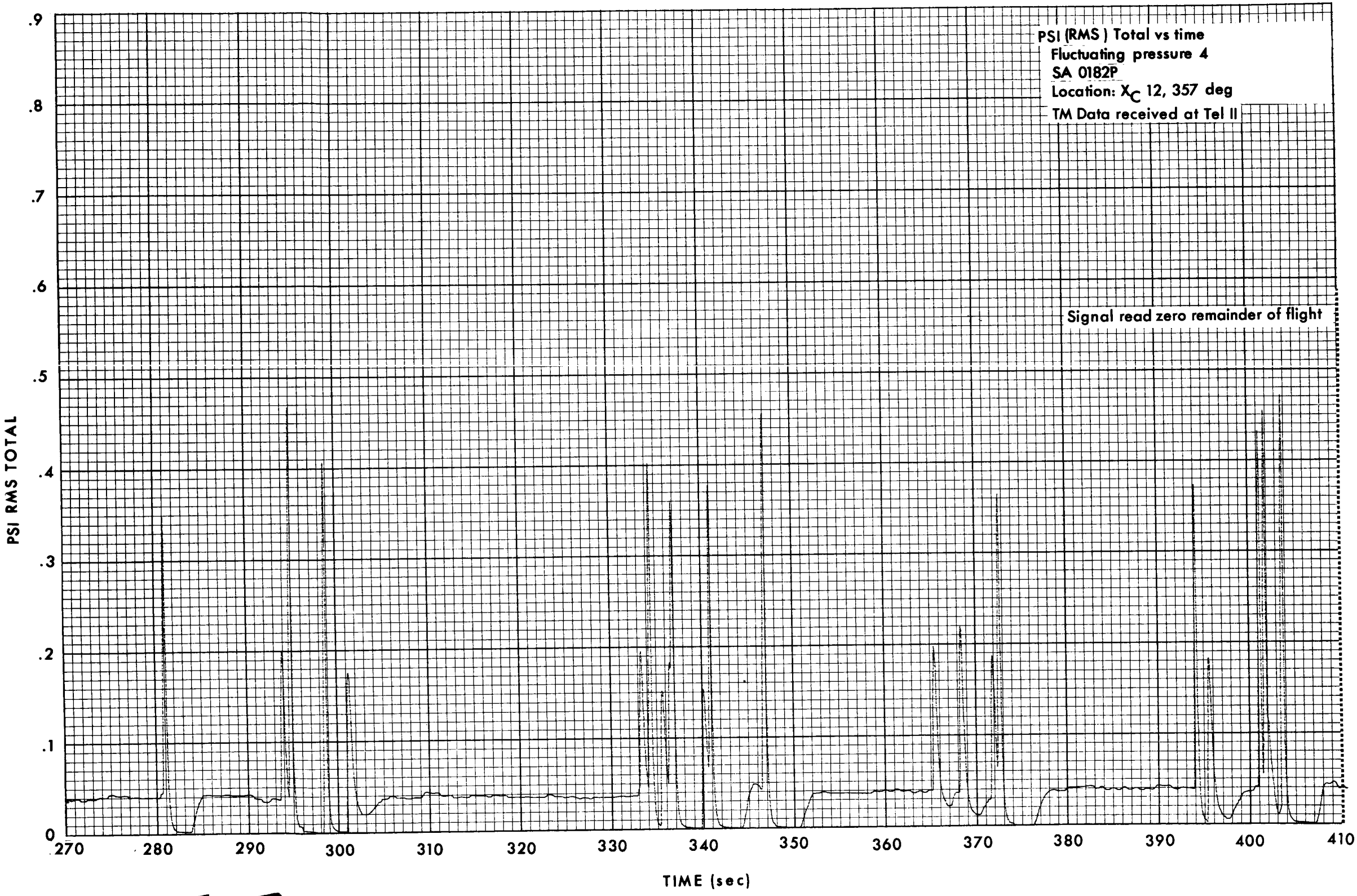
814.5

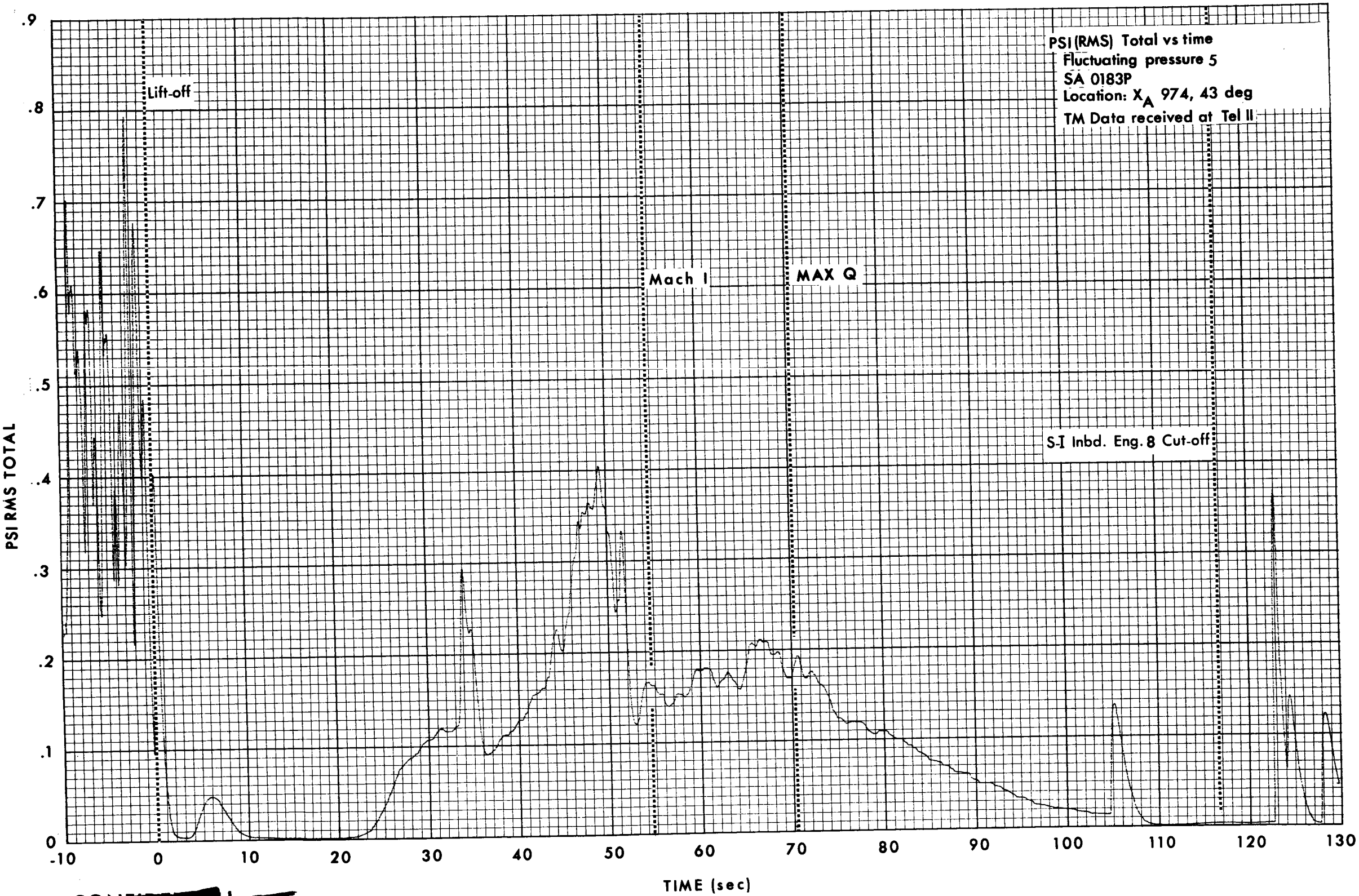
PSI (RMS) Total vs time
Fluctuating pressure 4
SA 0182P
Location: X_C 12, 357 deg
TM Data received at Tel II



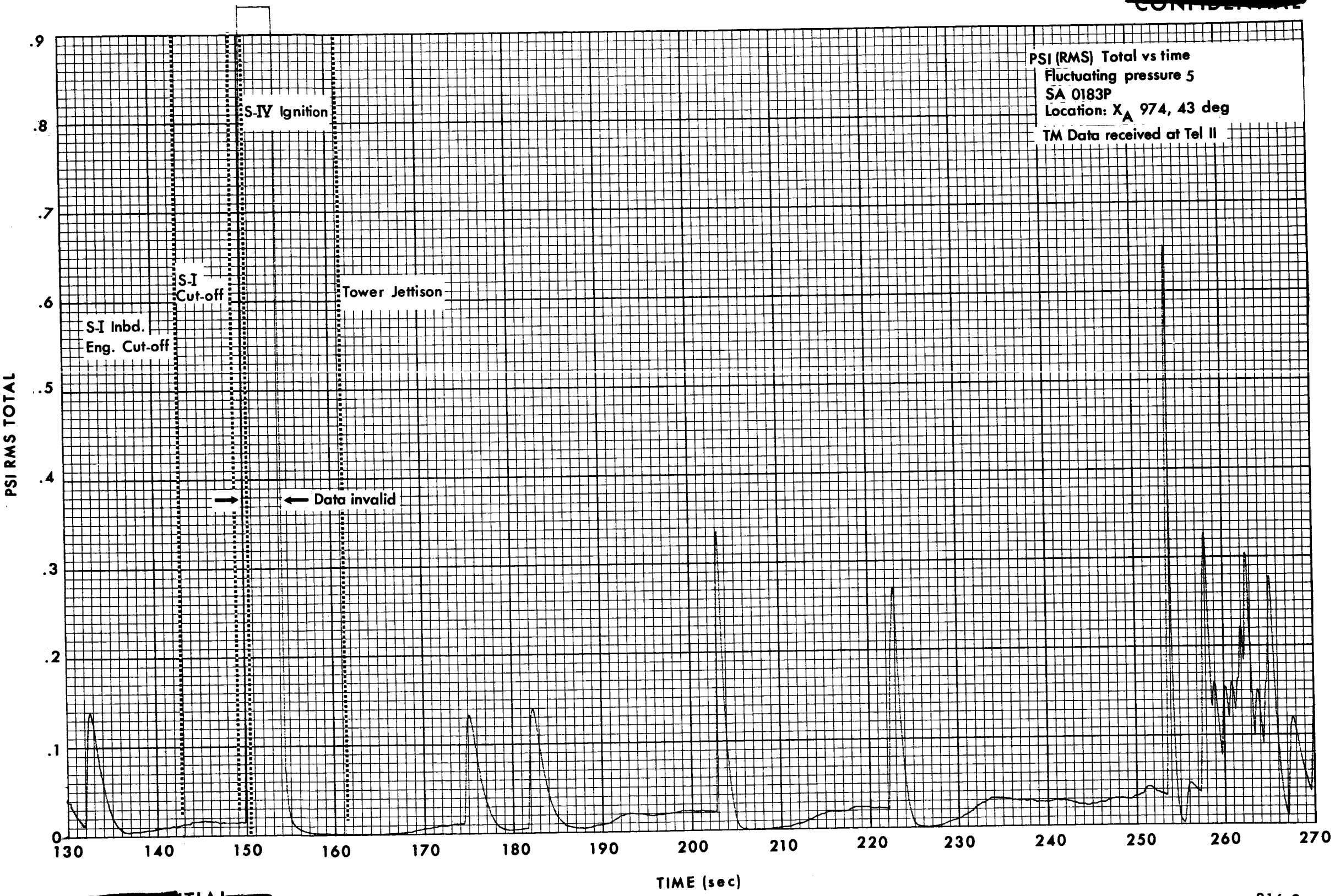
815.1

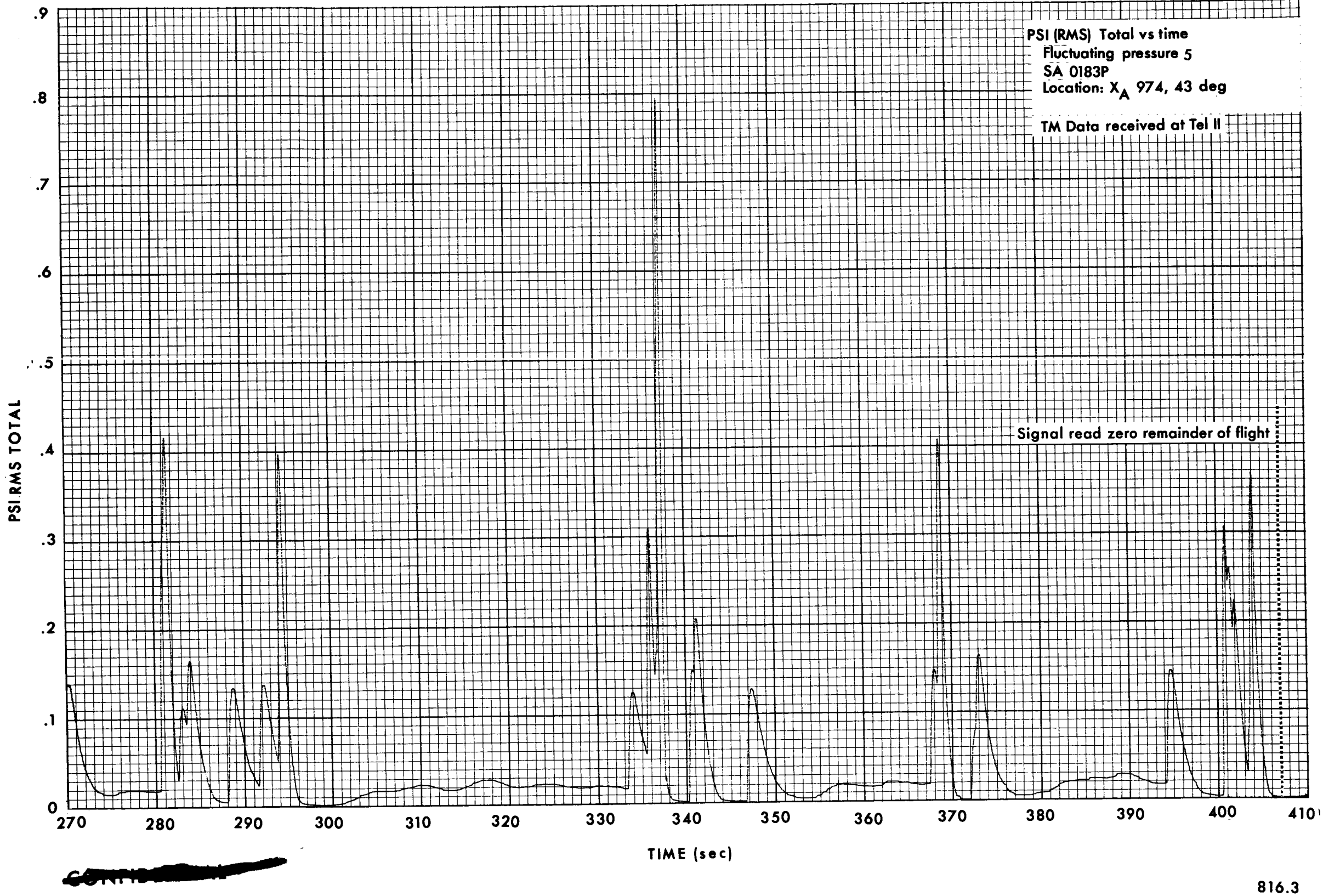

PSI (RMS) Total vs time
Fluctuating pressure 4
SA 0182P
Location: X_C 12, 357 deg
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

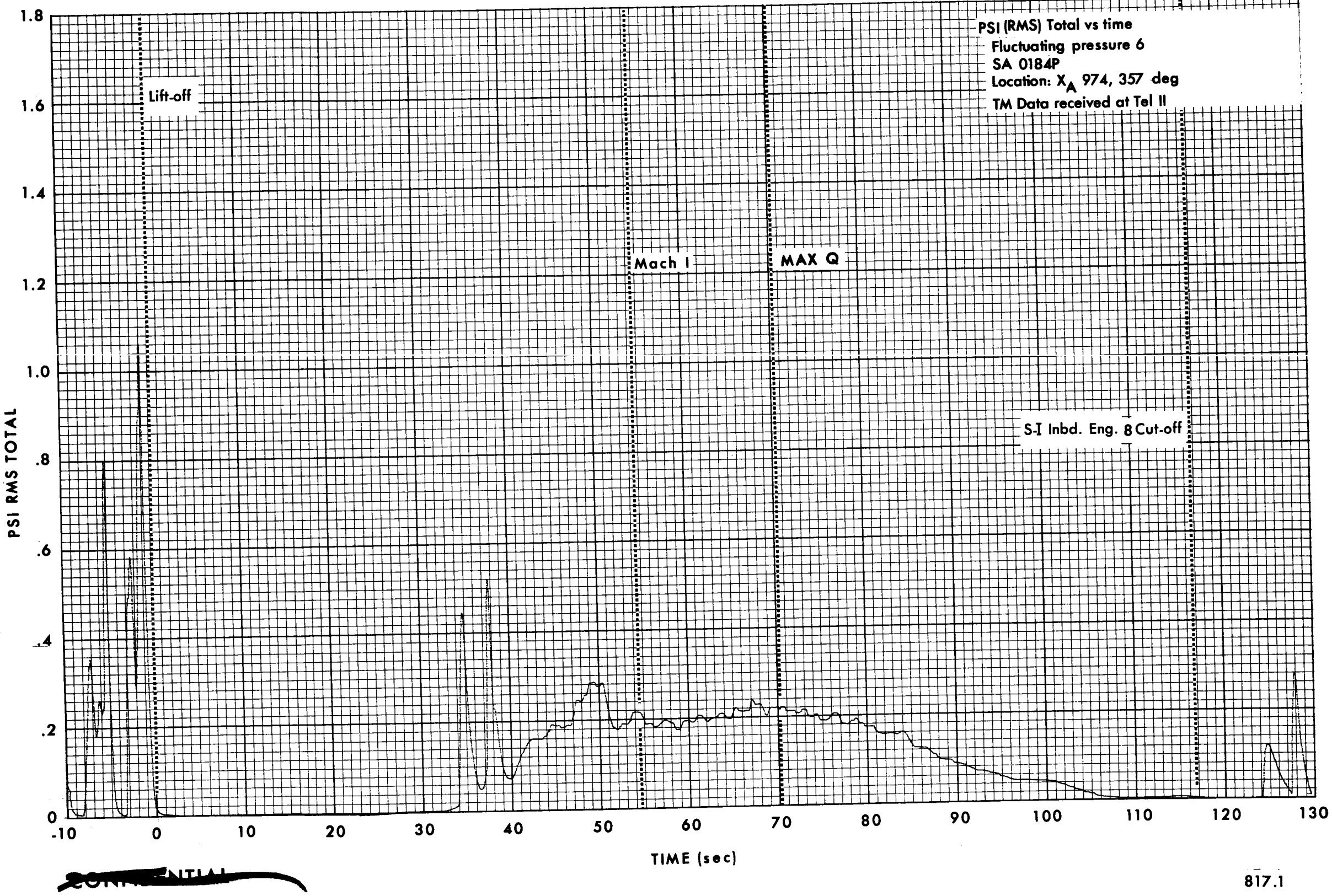

PSI (RMS) Total vs time
Fluctuating pressure 4
SA 0182P
Location: X_C 12, 357 deg
TM Data received at Tel II
Signal read zero remainder of flight
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)


PSI(RMS) Total vs time
Fluctuating pressure 5
SA 0183P
Location: X_A 974, 43 deg
TM Data received at Tel II
Lift-off
Mach I
MAX Q
S-I Inbd. Eng. 8 Cut-off
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

816.1


PSI (RMS) Total vs time
Fluctuating pressure 5
SA 0183P
Location: X_A 974, 43 deg
TM Data received at Tel II
S-IV Ignition
S-I Cut-off
Tower Jettison
S-I Inbd. Eng. Cut-off
Data invalid
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 5
SA 0183P
Location: X_A 974, 43 deg
TM Data received at Tel II
Signal read zero remainder of flight
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 6
SA 0184P
Location: X_A 974, 357 deg
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

PSI (RMS) Total vs time
Fluctuating pressure 6
SA 0184P
Location: X_A 974, 357 deg
TM Data received at Tel II

S-IV Ignition
S-I Inbd. Eng. Cut-off
Tower Jettison
S-I Cut-off
← Data invalid

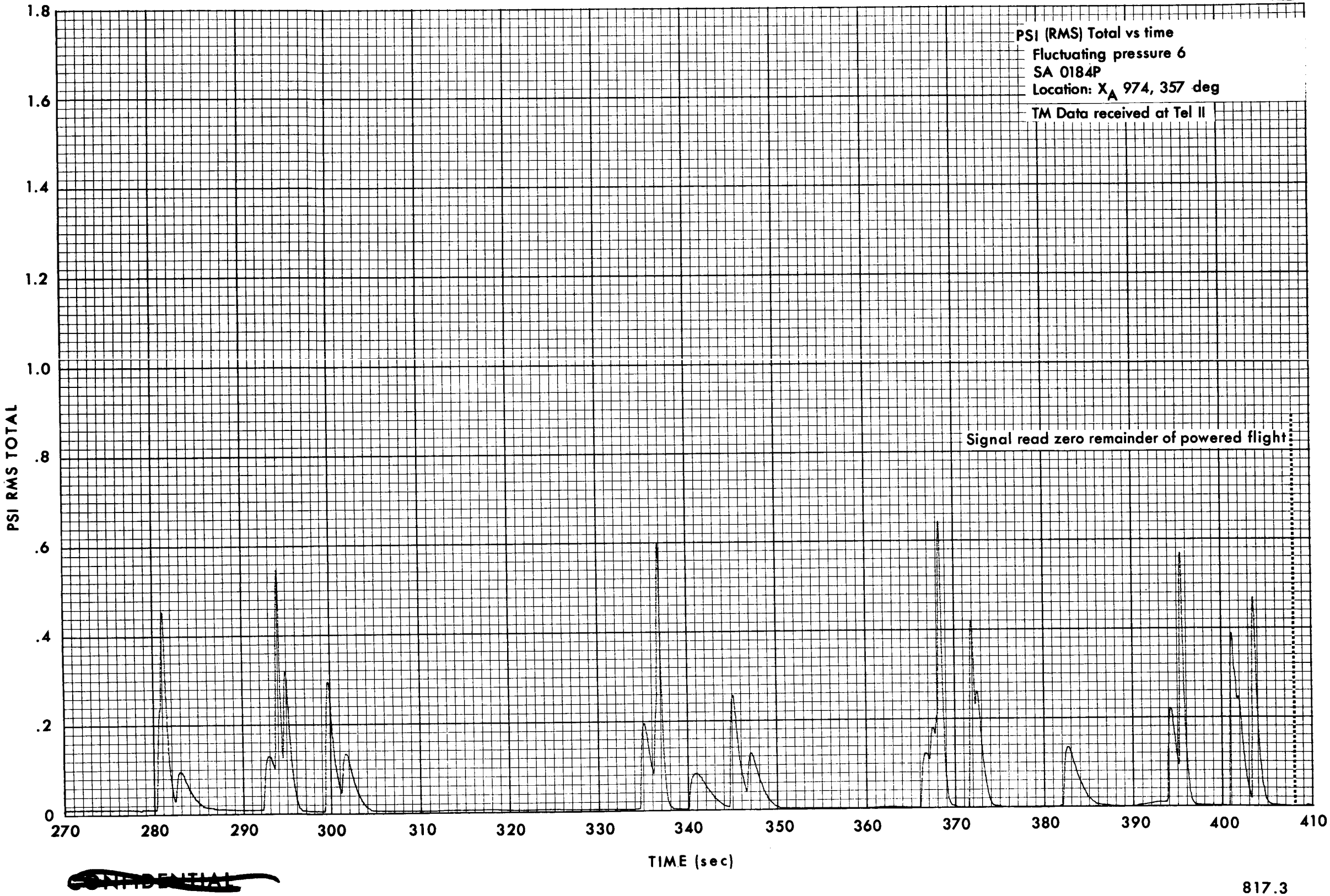
PSI RMS TOTAL

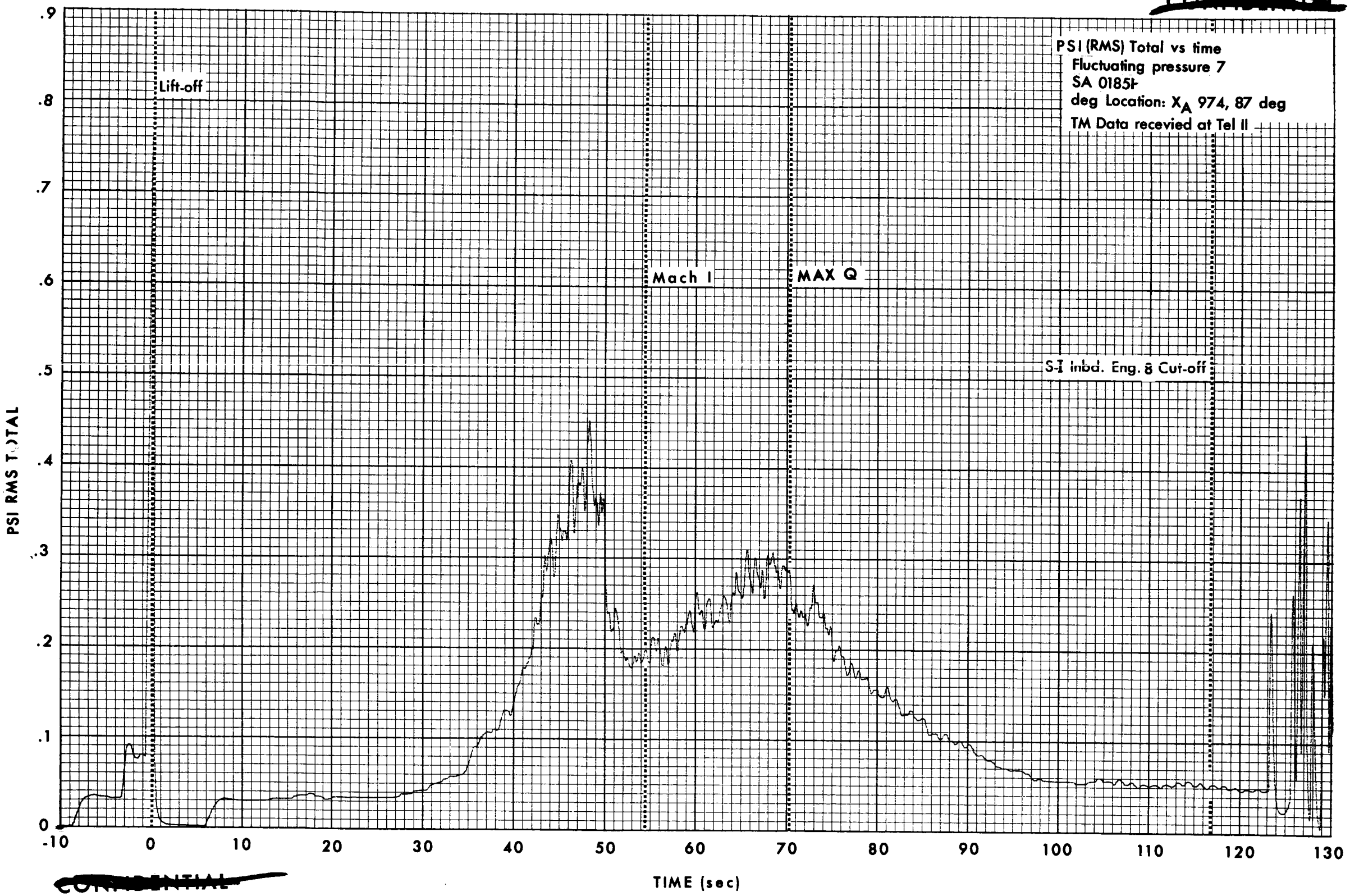
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0

130 140 150 160 170 180 190 200 210 220 230 240 250 260 270

TIME (sec)

817.2


PSI (RMS) Total vs time
Fluctuating pressure 6
SA 0184P
Location: X_A 974, 357 deg
TM Data received at Tel II
Signal read zero remainder of powered flight
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 7
SA 0185
deg Location: X_A 974, 87 deg
TM Data recevied at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)

PSI(RMS) Total vs time
Fluctuating pressure 7
SA 0185F
deg Location: X_A 974, 87 deg
TM Data recevied at Tel II

S-IV Ignition

S-I Inbd.
Eng. Cut-off

Tower Jettison

S-I
Cut-off

← Data invalid

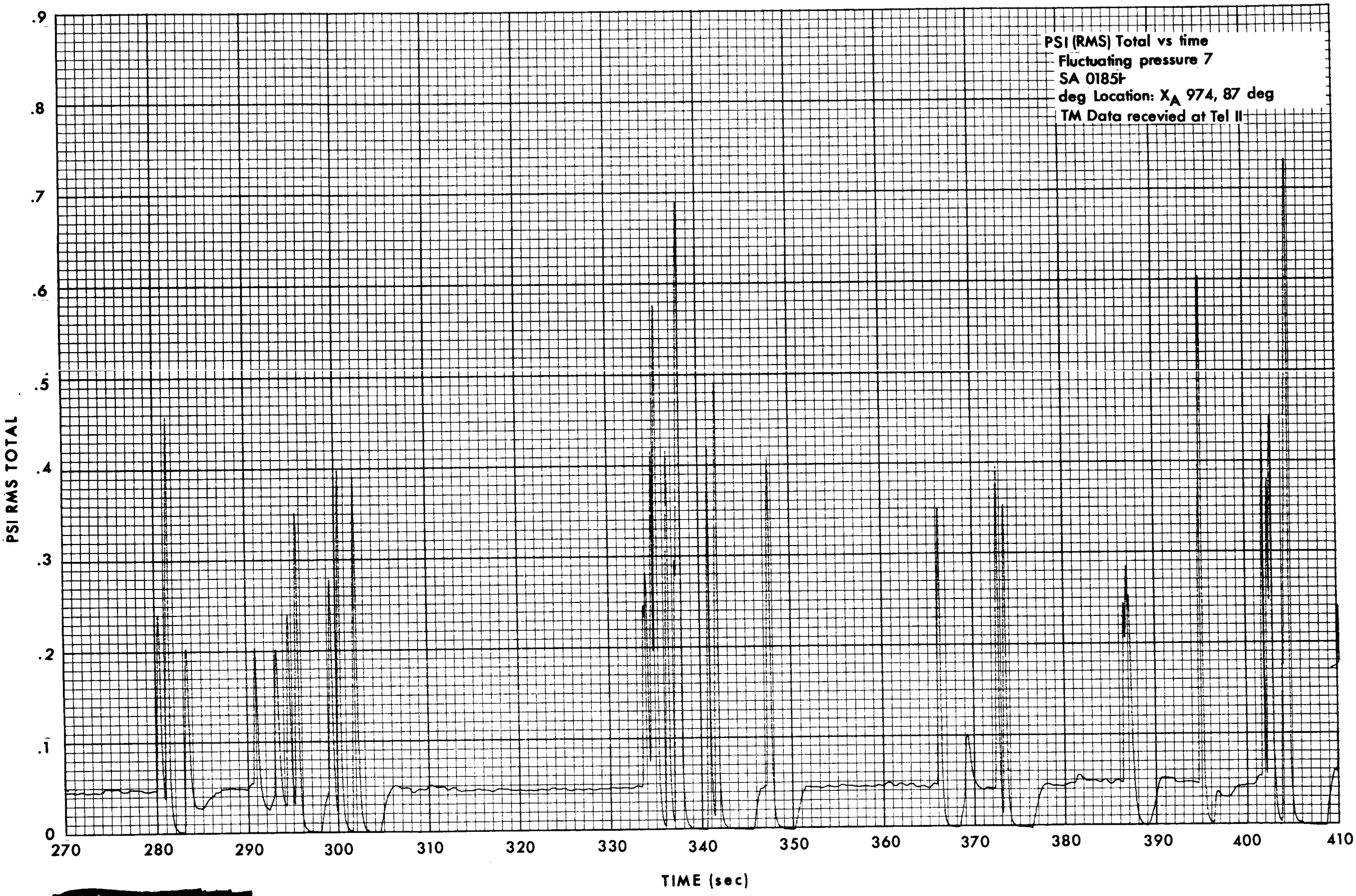
PSI RMS TOTAL

.9
.8
.7
.6
.5
.4
.3
.2
.1
0

130 140 150 160 170 180 190 200 210 220 230 240 250 260 270

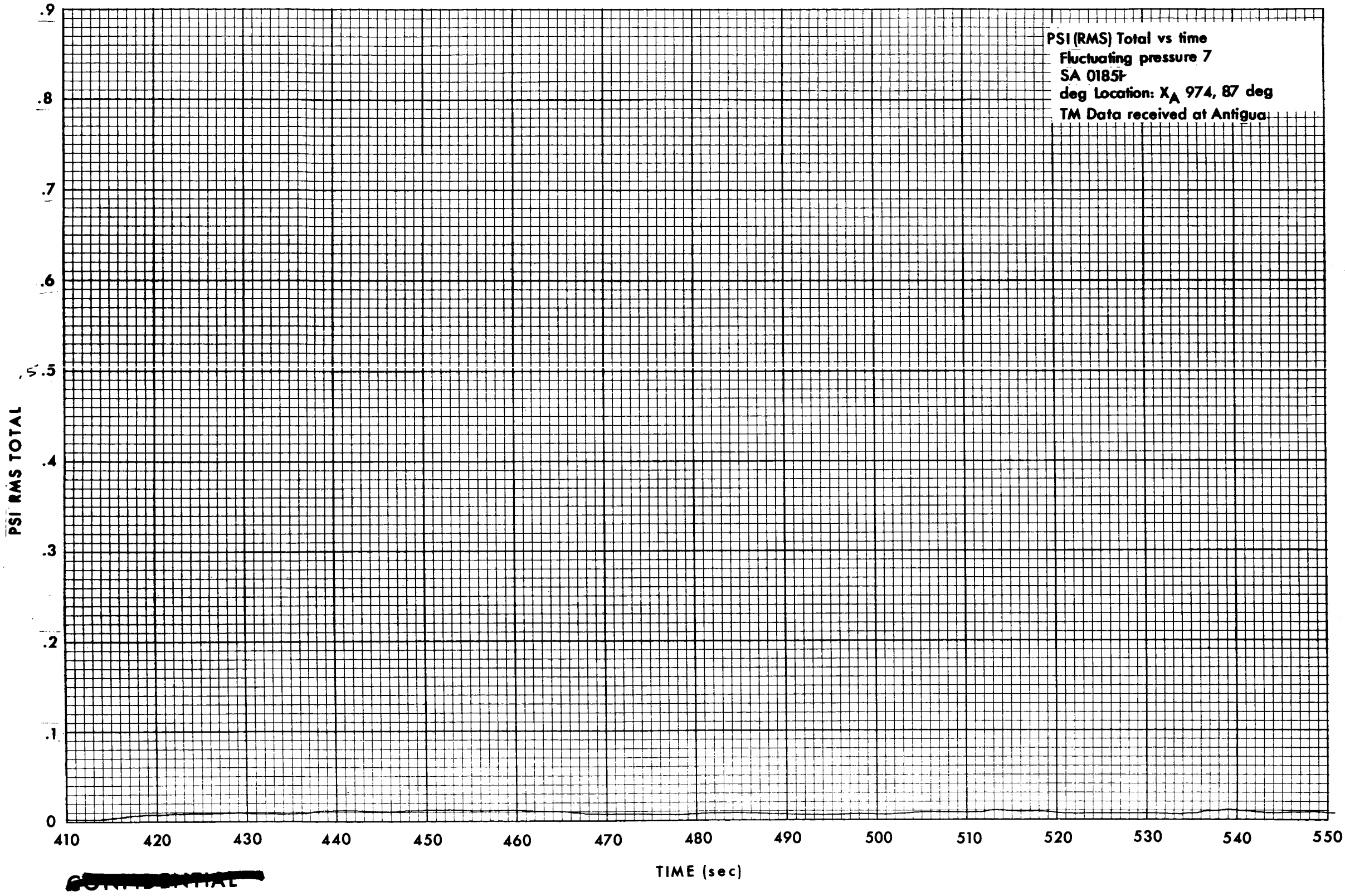
TIME (sec)

818.2


PSI (RMS) Total vs time
Fluctuating pressure 7
SA 0185t
deg Location: X_A 974, 87 deg
TM Data recevied at Tel II
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)

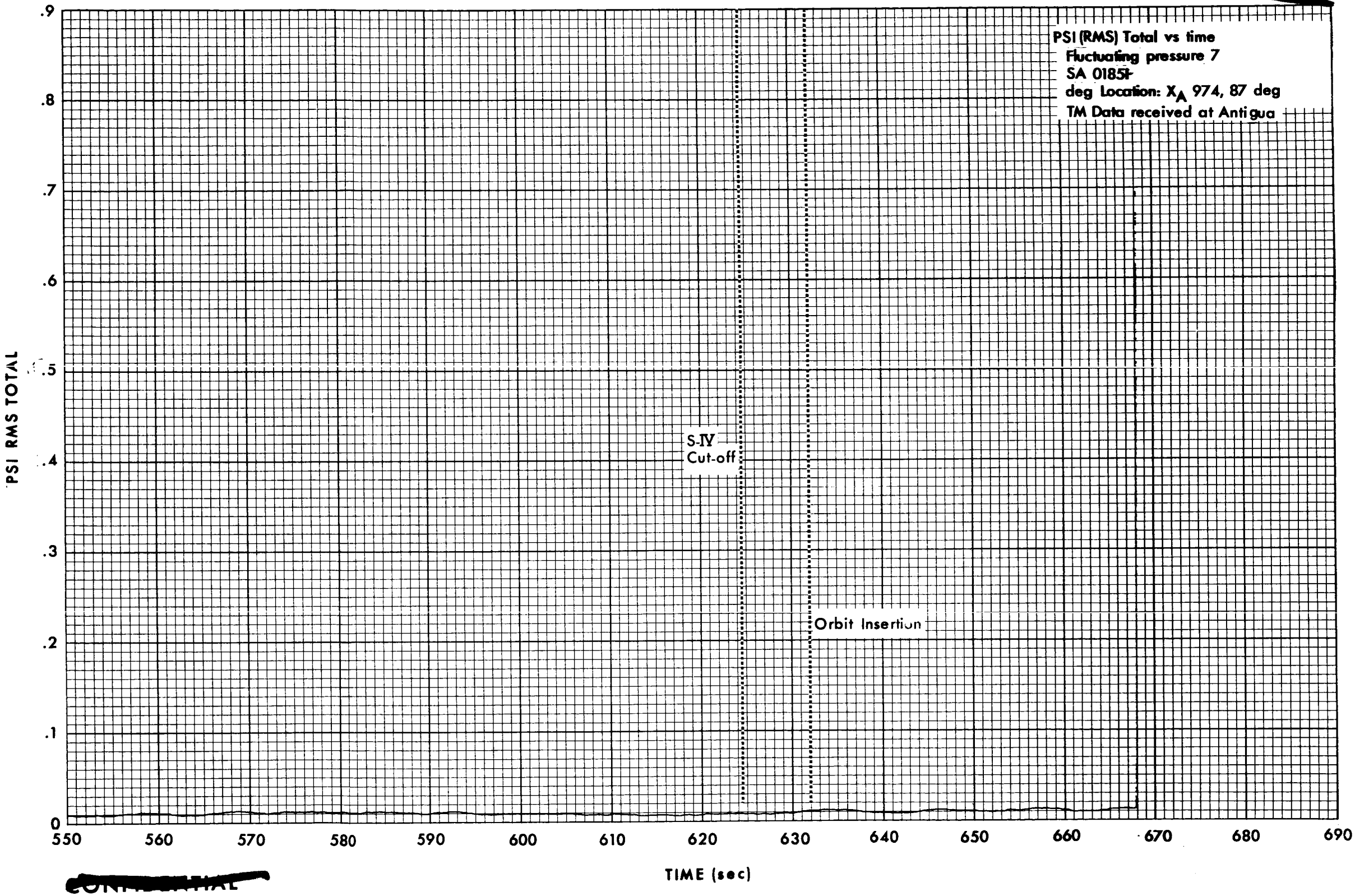
818.3

[redacted]



[redacted]

818.4


PSI (RMS) Total vs time
Fluctuating pressure 7
SA 0185+
deg Location: X_A 974, 87 deg
TM Data received at Antigua
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
S-IV
Cut-off
Orbit Insertion
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690
TIME (sec)

[redacted]

PSI (RMS) Total vs time
Fluctuating pressure 8
SA 0186P
Location: X_A 974, 177 deg

Lift-off

Mach 1

MAX Q

S-I Inbd. Eng. 8 Cut-off

PSI RMS TOTAL

.9
.8
.7
.6
.5
.4
.3
.2
.1
0

-10 0 10 20 30 40 50 60 70 80 90 100 110 120 130

TIME (sec)

[redacted]

819.1

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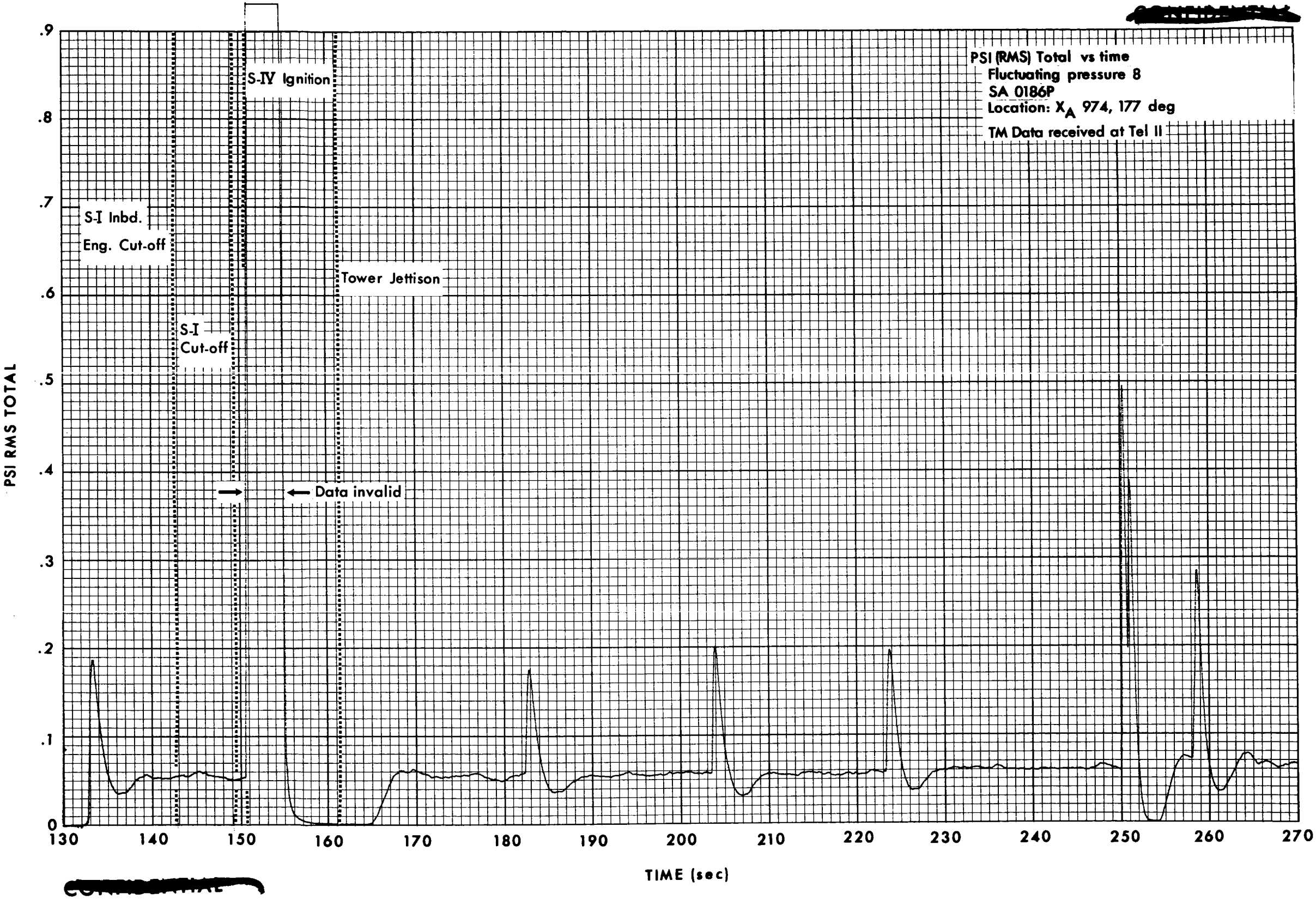
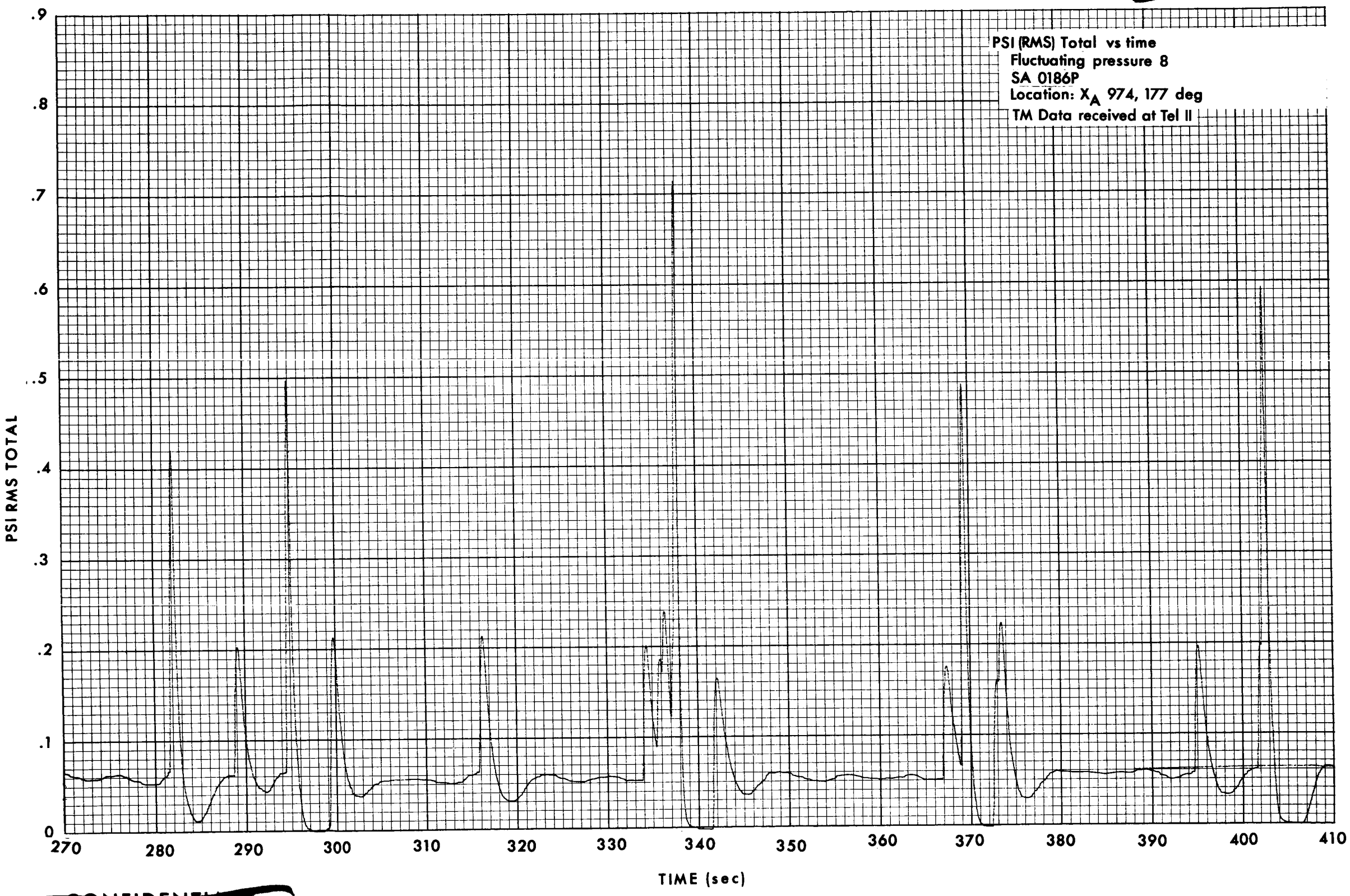


CONFIDENTIAL

819.2

CONFIDENTIAL



CONFIDENTIAL

PSI (RMS) Total vs time
Fluctuating pressure 8
SA 0186P
Location: X_A 974, 177 deg
TM Data received at Antigua

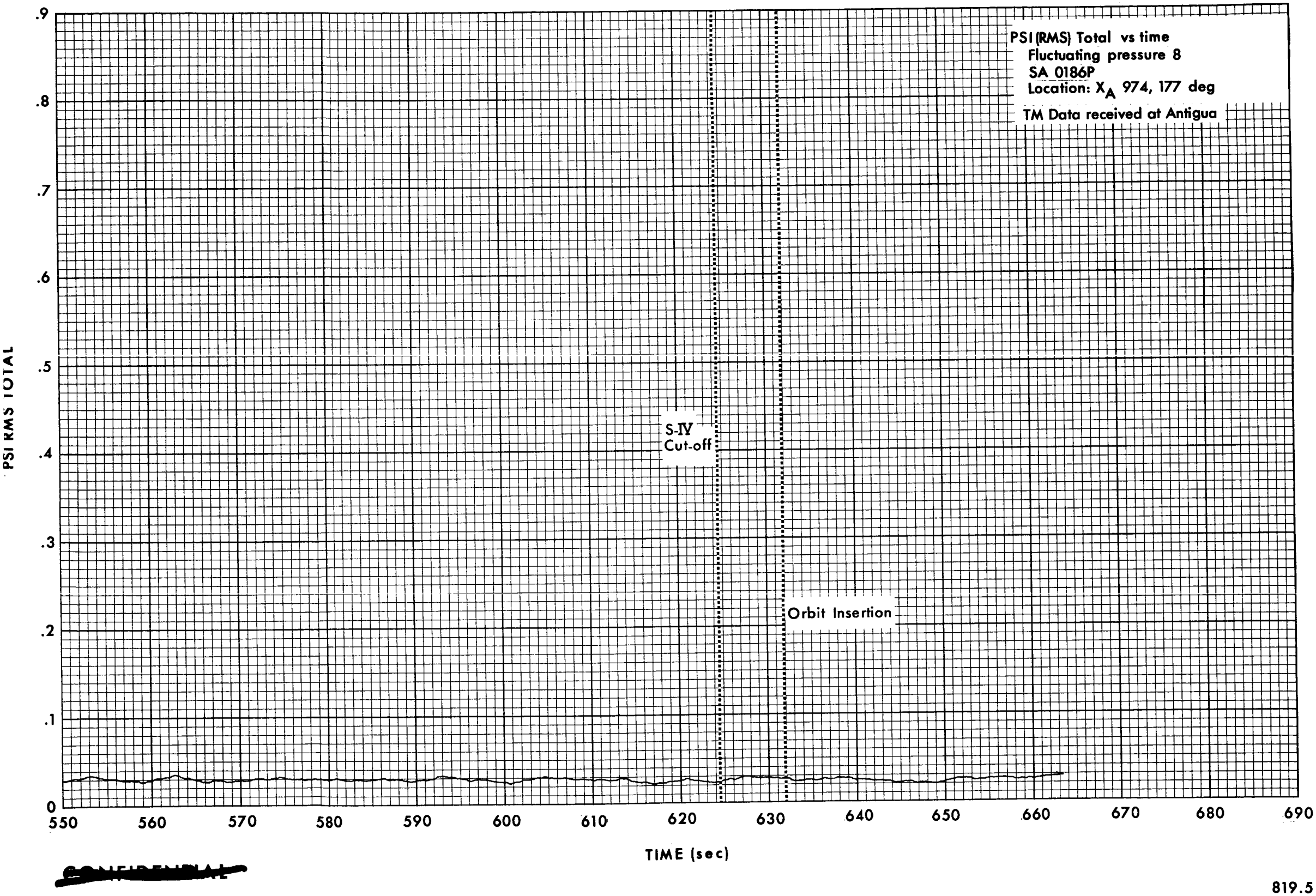
PSI RMS TOTAL

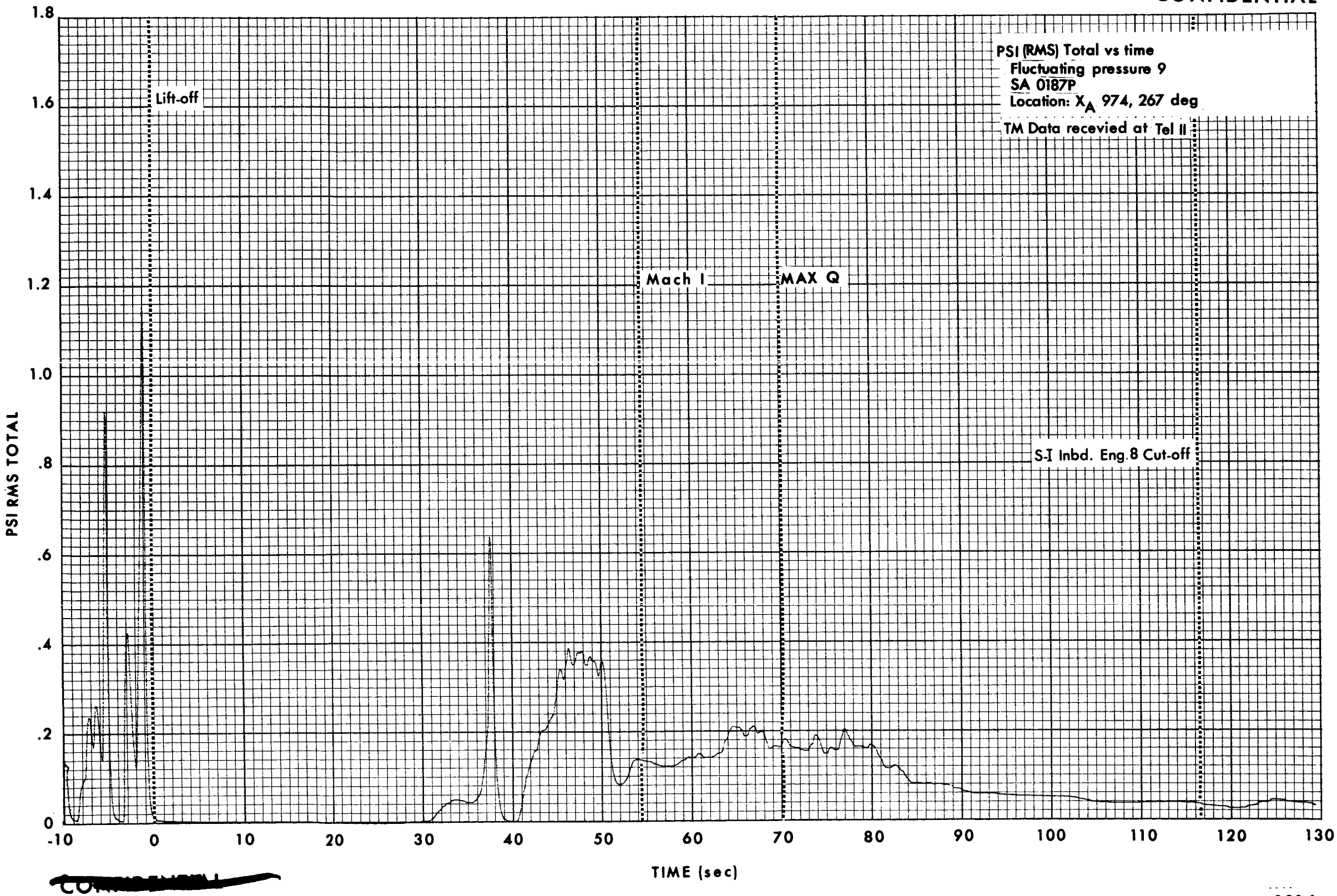
.9
.8
.7
.6
.5
.4
.3
.2
.1
0

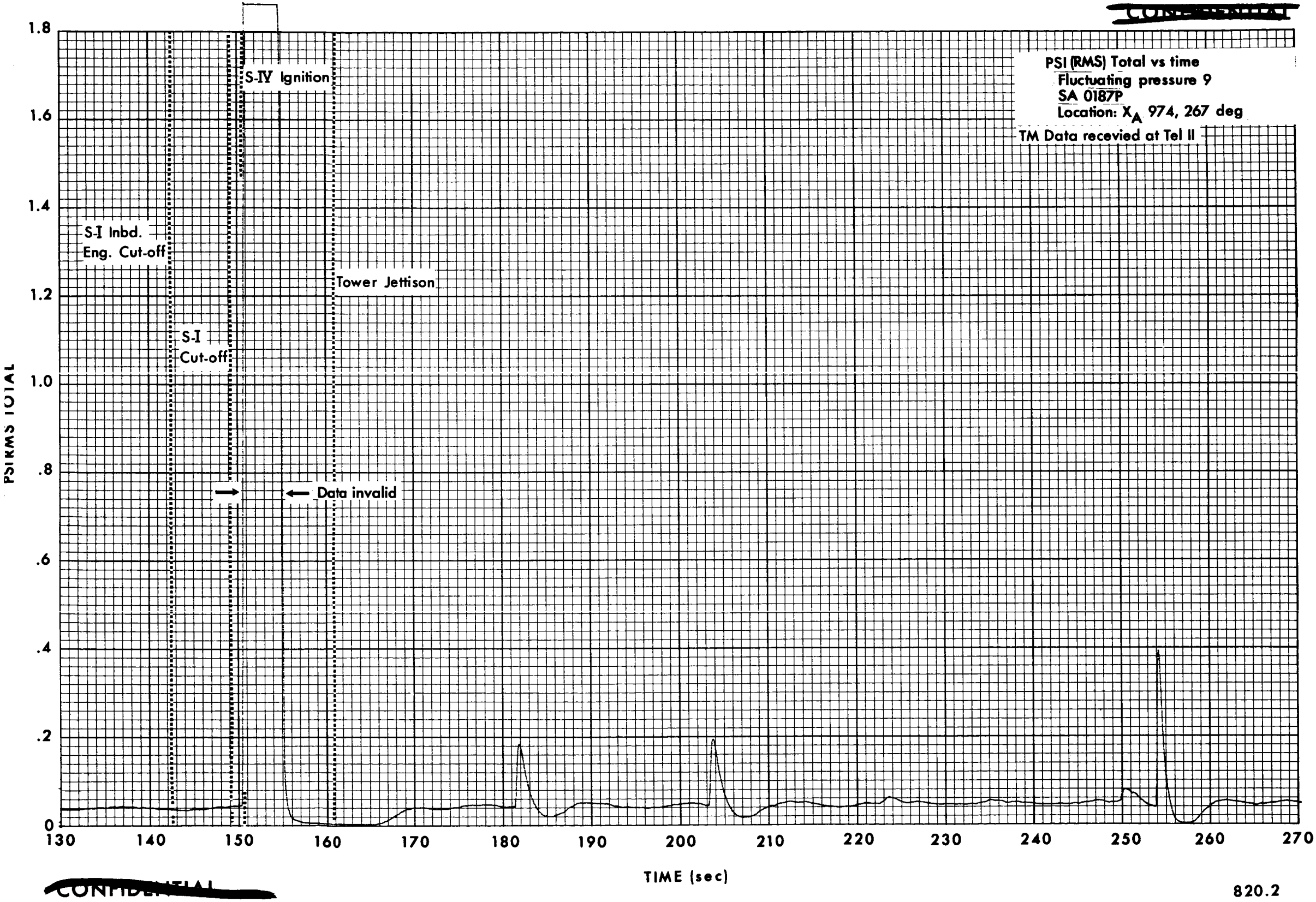
410 420 430 440 450 460 470 480 490 500 510 520 530 540 550

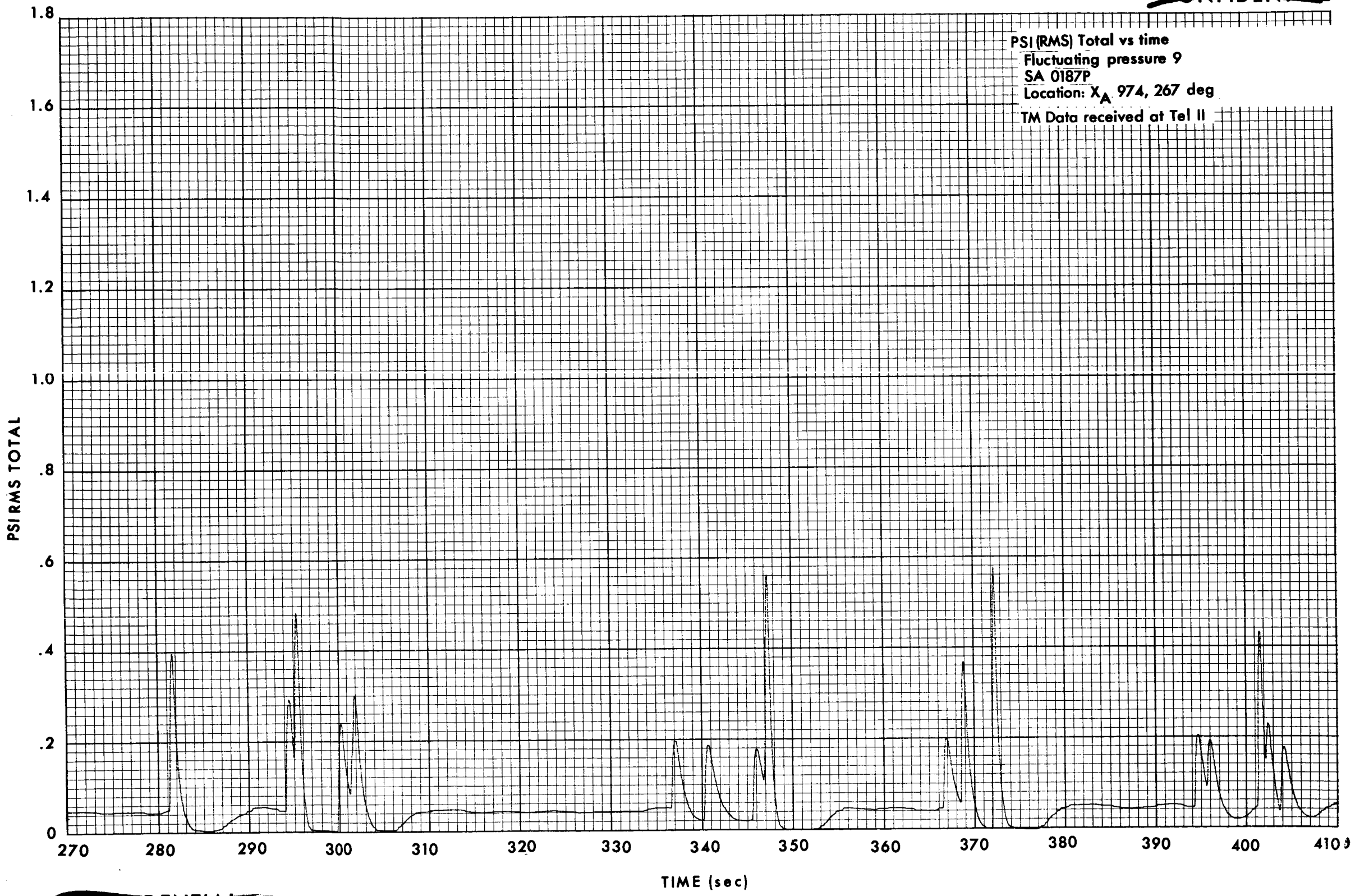
TIME (sec)

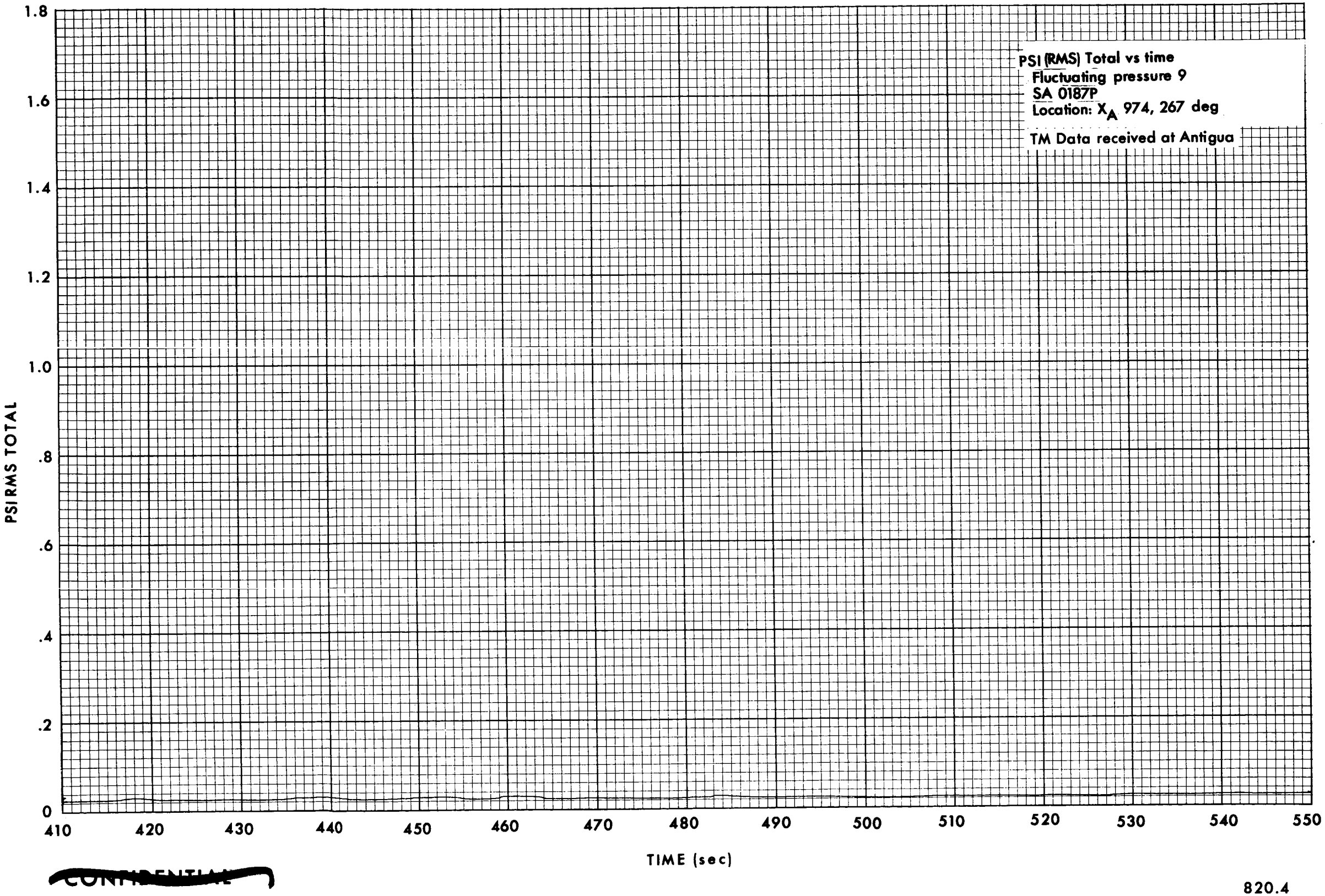
819.4


PSI (RMS) Total vs time
Fluctuating pressure 8
SA 0186P
Location: X_A 974, 177 deg
TM Data received at Antigua
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
S-IV
Cut-off
Orbit Insertion
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 9
SA 0187P
Location: X_A 974, 267 deg
TM Data recevied at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng.8 Cut-off
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 9
SA 0187P
Location: X_A 974, 267 deg
TM Data recevied at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 9
SA 0187P
Location: X_A 974, 267 deg
TM Data received at Tel II
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 9
SA 0187P
Location: X_A 974, 267 deg
TM Data received at Antigua
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
410
420
430
440
450
460
470
480
490
500
510
520
530
540
550
TIME (sec)

[redacted]

PSI (RMS) Total vs time
Fluctuating pressure 9
SA 0187P
Location: X_A 974, 267 deg

TM Data received at Antigua

PSI RMS TOTAL

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0

S-IV
Cut-off

Orbit Insertion

550 560 570 580 590 600 610 620 630 640 650 660 670 680 690

TIME (sec)

[redacted]

820.5

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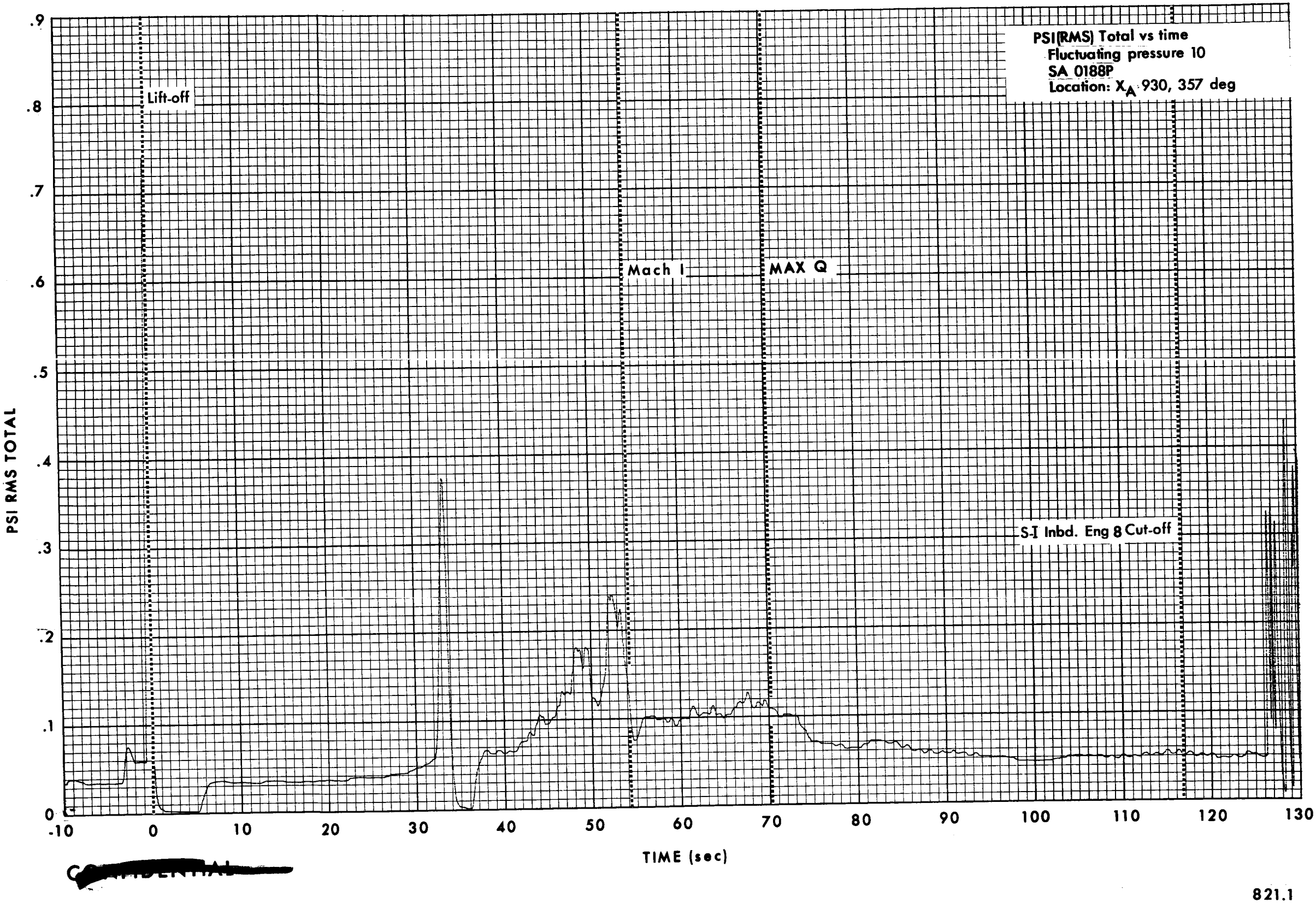
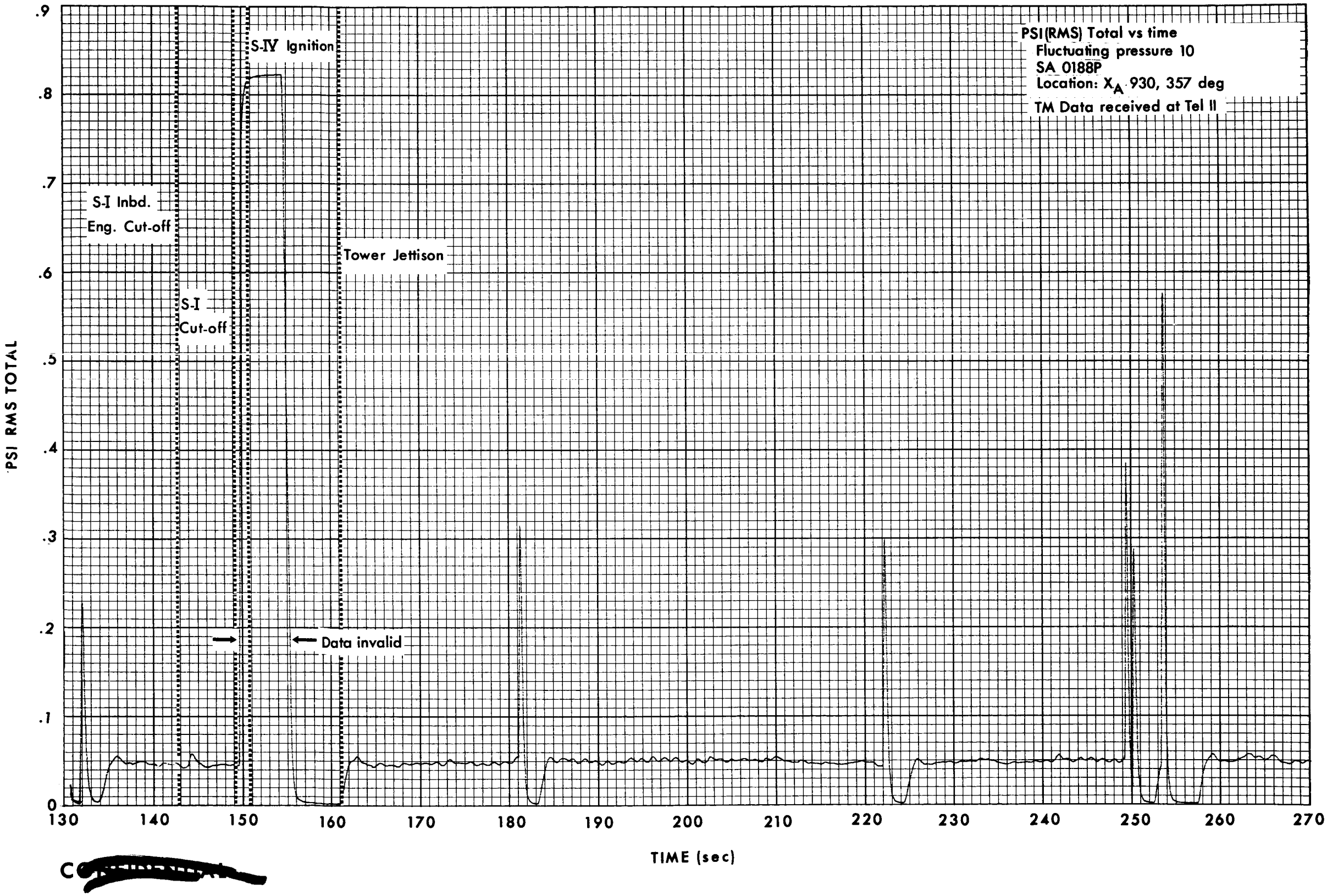
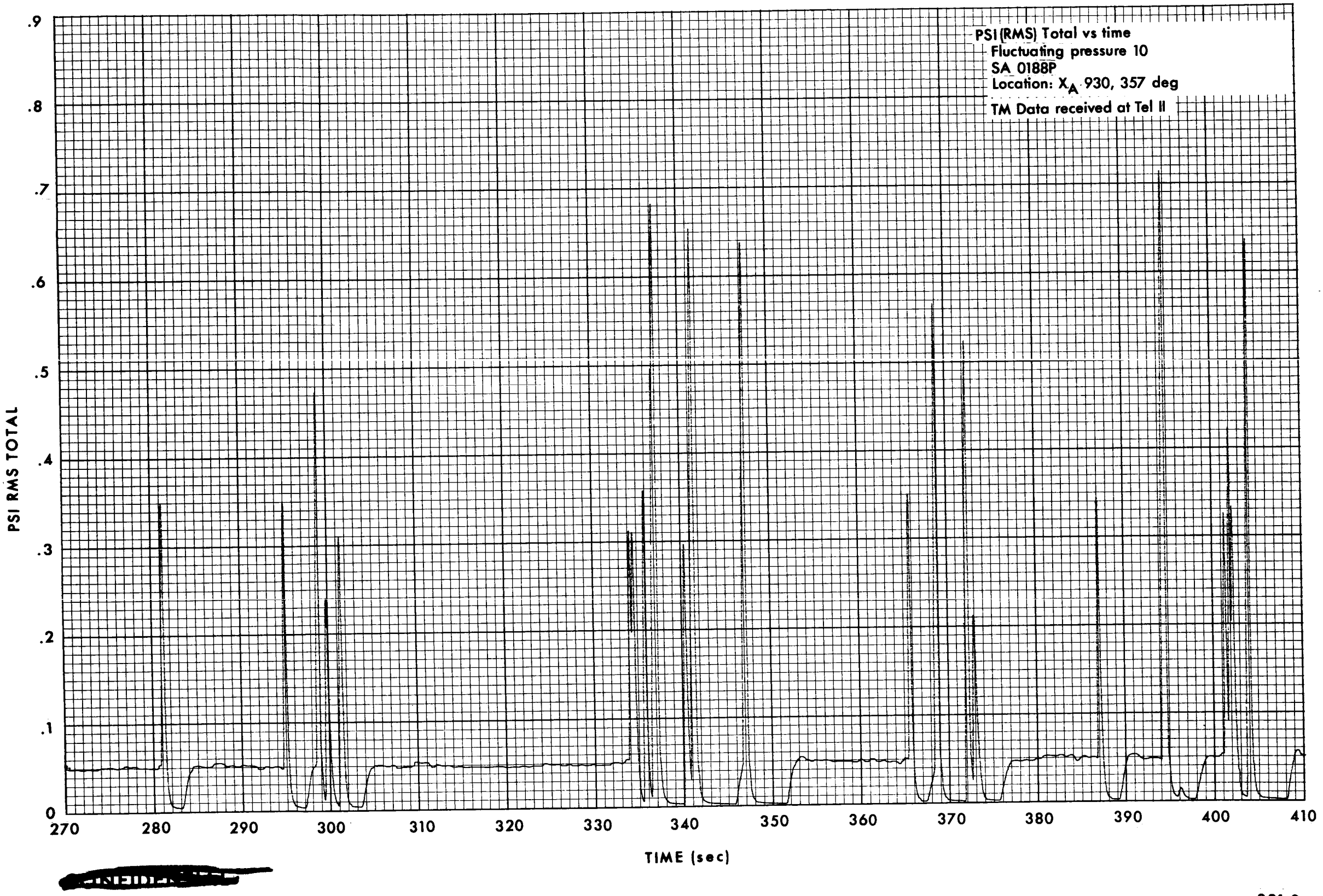


CONFIDENTIAL


PSI(RMS) Total vs time
Fluctuating pressure 10
SA 0188P
Location: X_A 930, 357 deg
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
S-I
Cut-off
Tower Jettison
Data invalid
PSI RMS TOTAL
TIME (sec)
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270

821.2


PSI(RMS) Total vs time
Fluctuating pressure 10
SA 0188P
Location: X_A 930, 357 deg
TM Data received at Tel II
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)

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PSI(RMS) Total vs time
Fluctuating pressure 10
SA 0188P
Location: X_A 930, 357 deg

TM Data received at Antigua

PSI RMS TOTAL

.9
.8
.7
.6
.5
.4
.3
.2
.1
0

410 420 430 440 450 460 470 480 490 500 510 520 530 540 550

TIME (sec)

~~CONFIDENTIAL~~

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PSI (RMS) Total vs time
Fluctuating pressure 10
SA 0188P
Location: X_A 930, 357 deg
TM Data received at Antigua

PSI RMS TOTAL

.9
.8
.7
.6
.5
.4
.3
.2
.1
0

S-IV
Cut-off

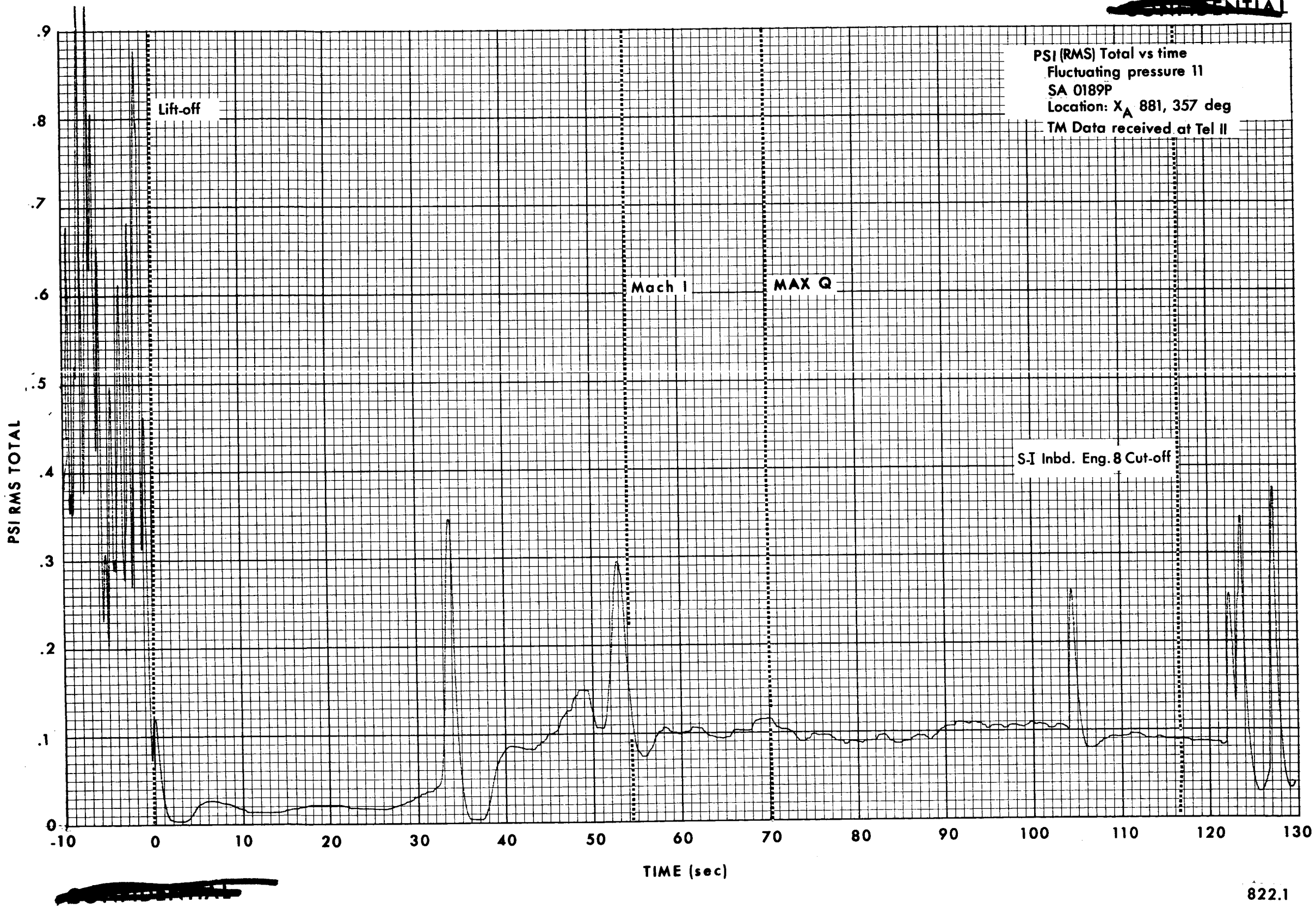
Orbit Insertion

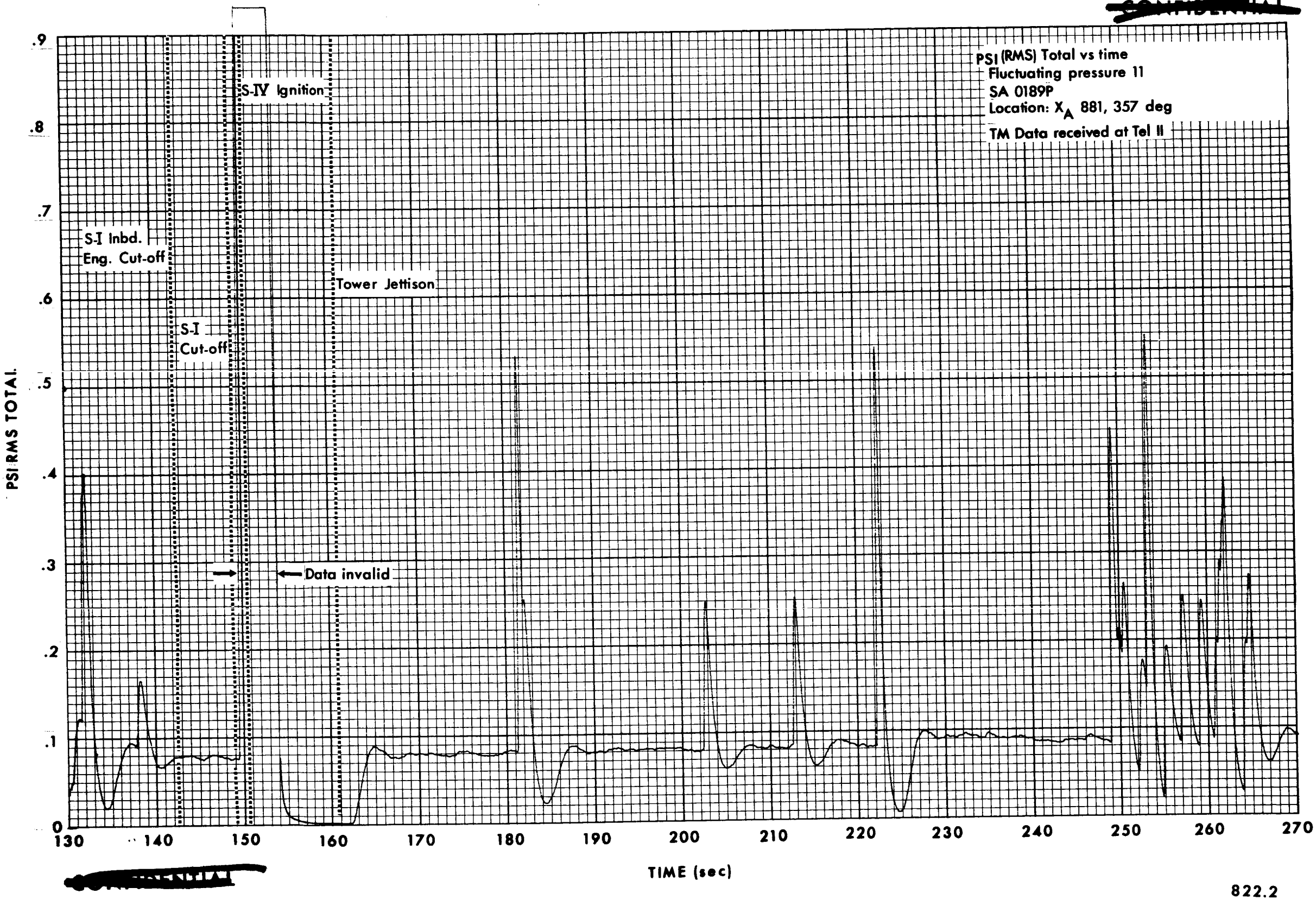
550 560 570 580 590 600 610 620 630 640 650 660 670 680 690

TIME (sec)

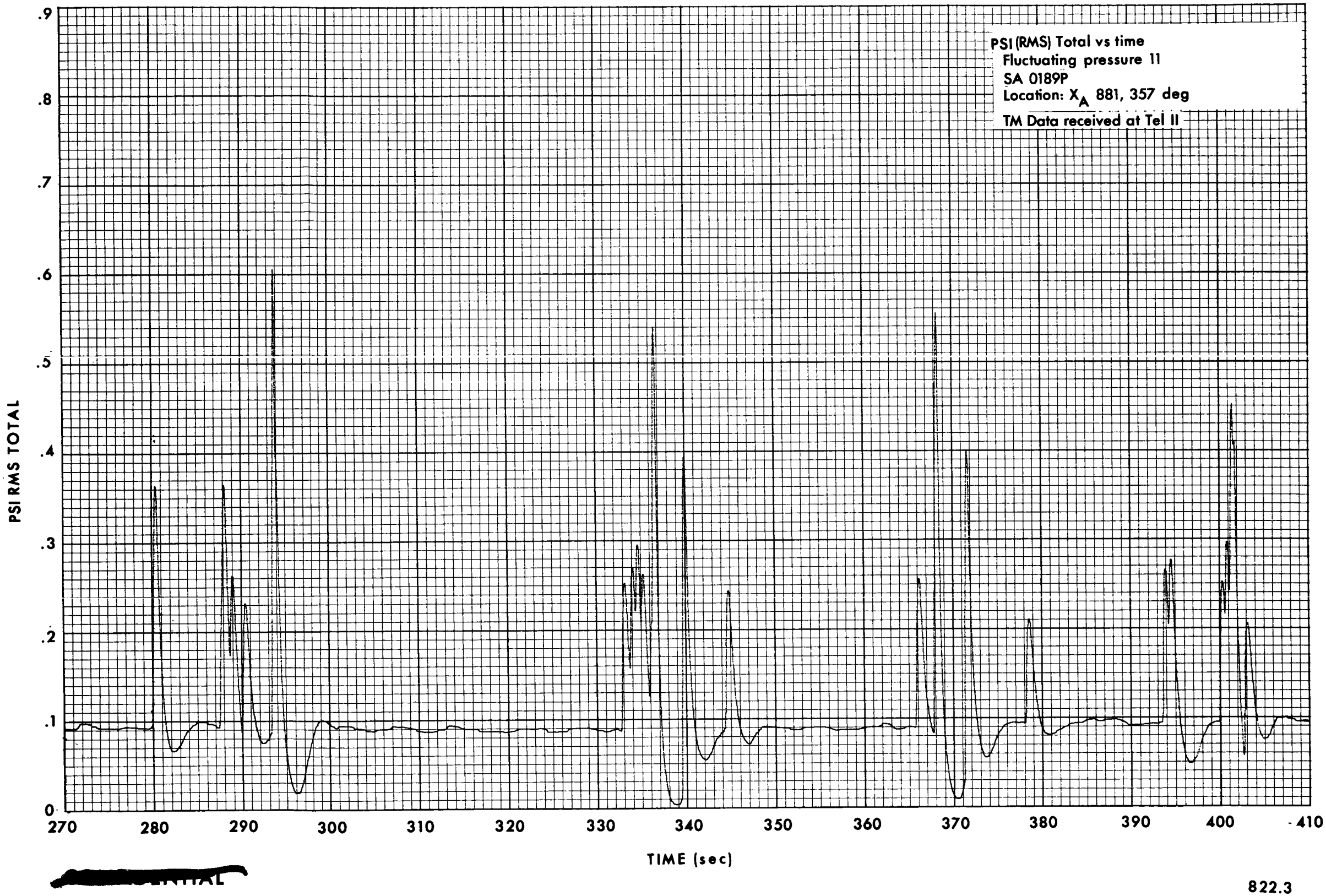
CONFIDENTIAL

821.5

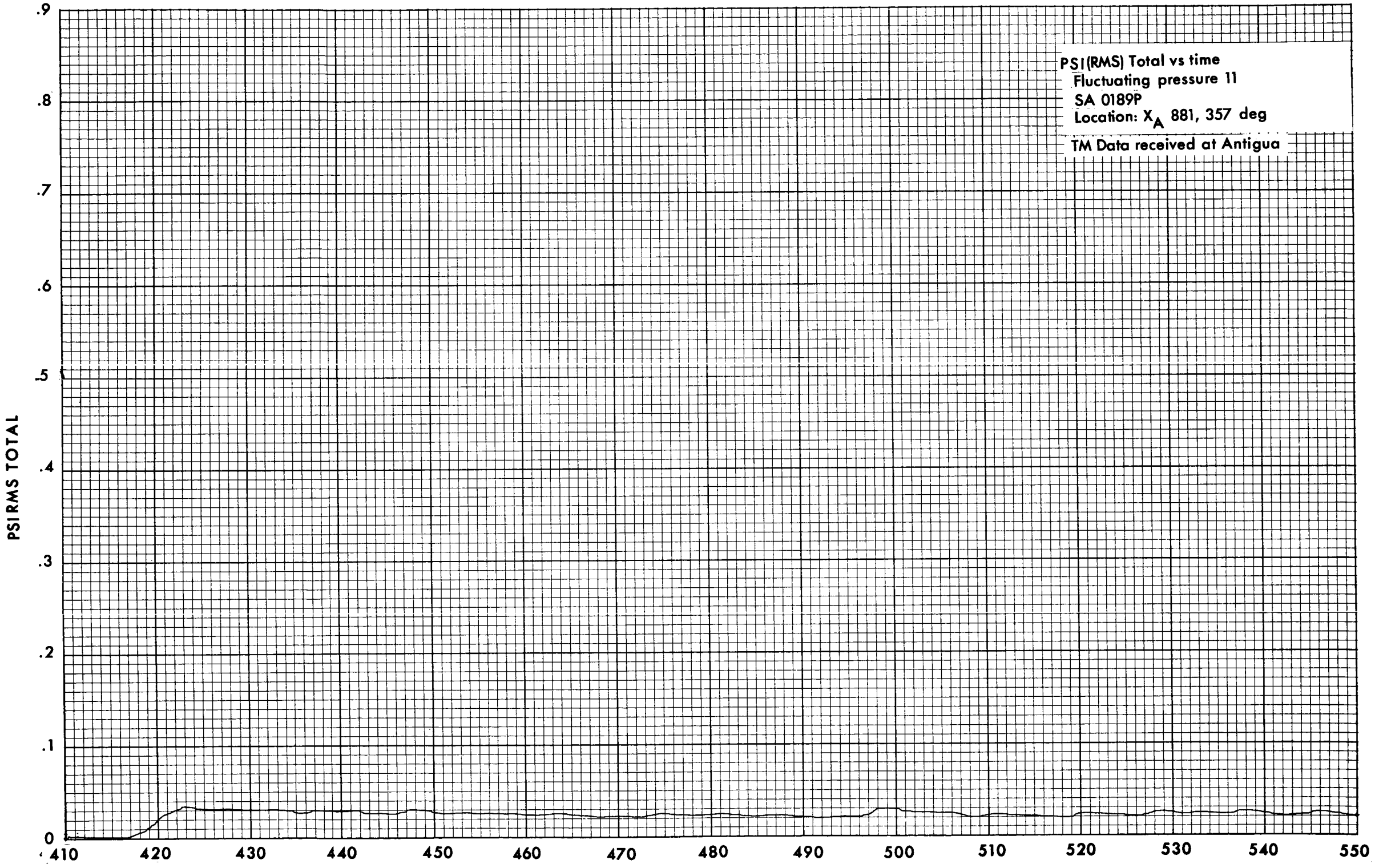

PSI (RMS) Total vs time
Fluctuating pressure 11
SA 0189P
Location: X_A 881, 357 deg
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 11
SA 0189P
Location: X_A 881, 357 deg
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
Tower Jettison
S-I
Cut-off
Data invalid
PSI RMS TOTAL
.9
.8
.7
.6
.5
.4
.3
.2
.1
0
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

822.2


PSI (RMS) Total vs time
Fluctuating pressure 11
SA 0189P
Location: X_A 881, 357 deg
TM Data received at Tel II
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)

~~CONFIDENTIAL~~



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PSI (RMS) Total vs time
Fluctuating pressure 11
SA 0189P
Location: X_A 881, 357 deg

TM Data received at Antigua

PSI RMS TOTAL

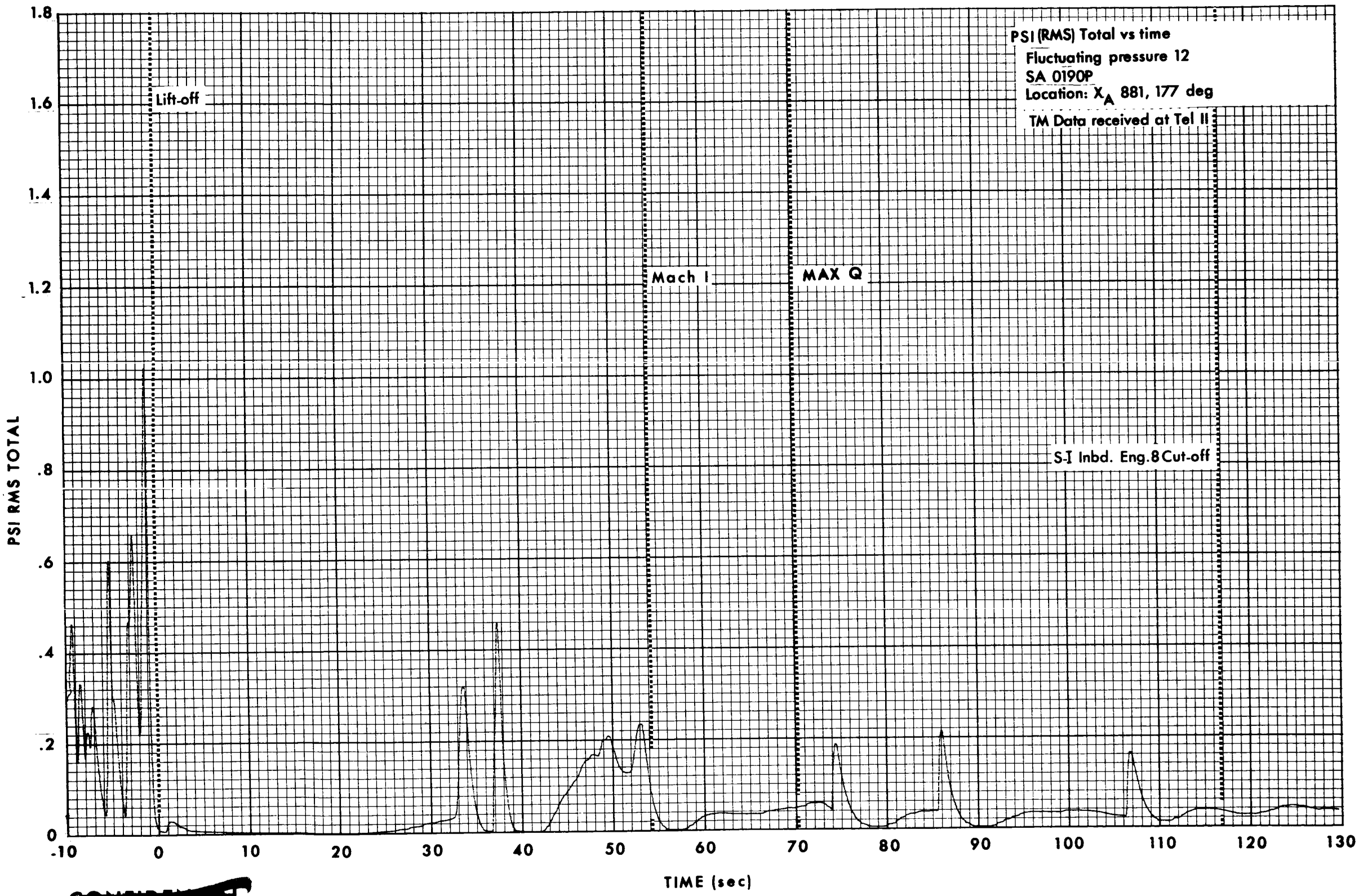
.9
.8
.7
.6
.5
.4
.3
.2
.1
0

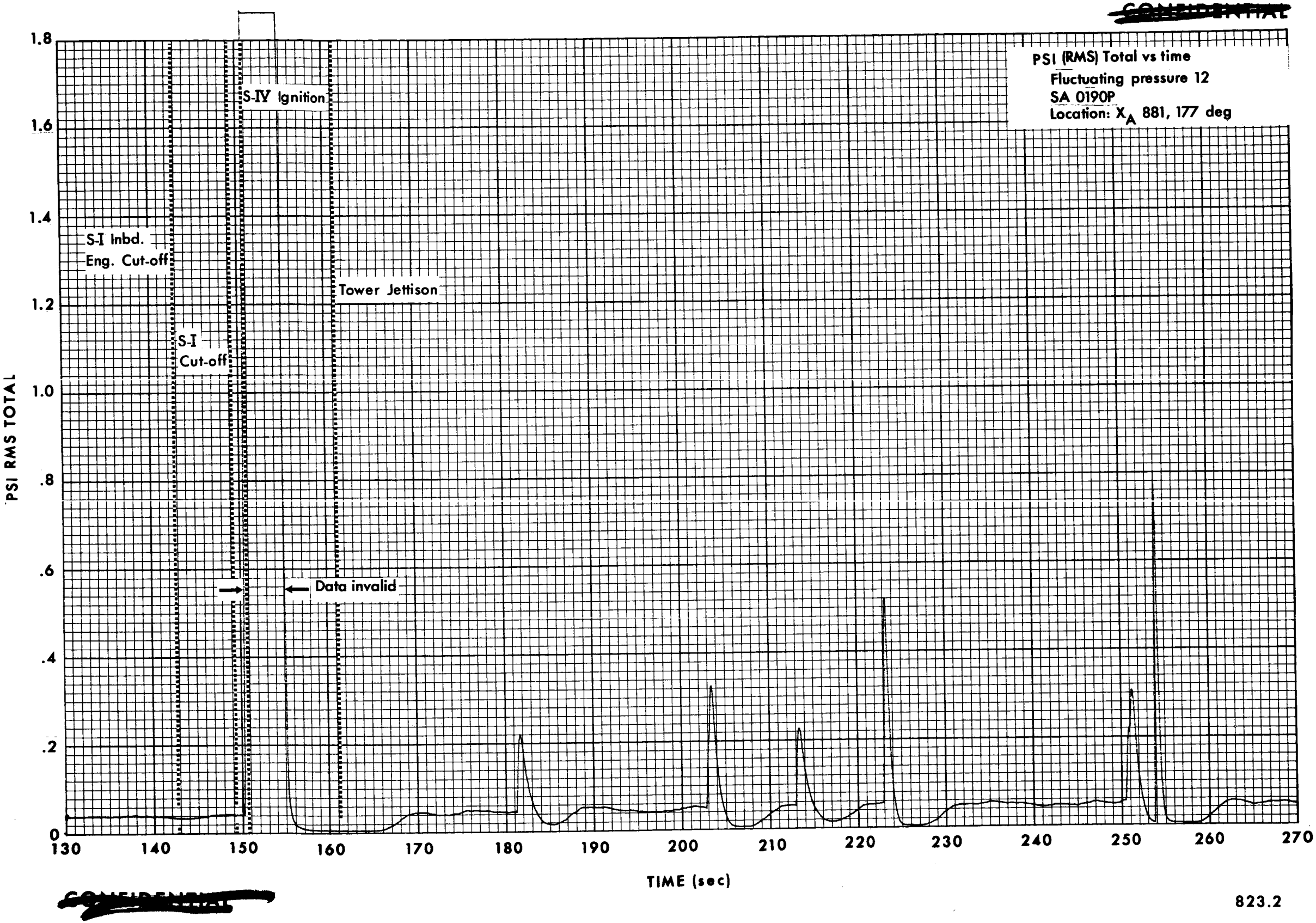
IV
Cut-off

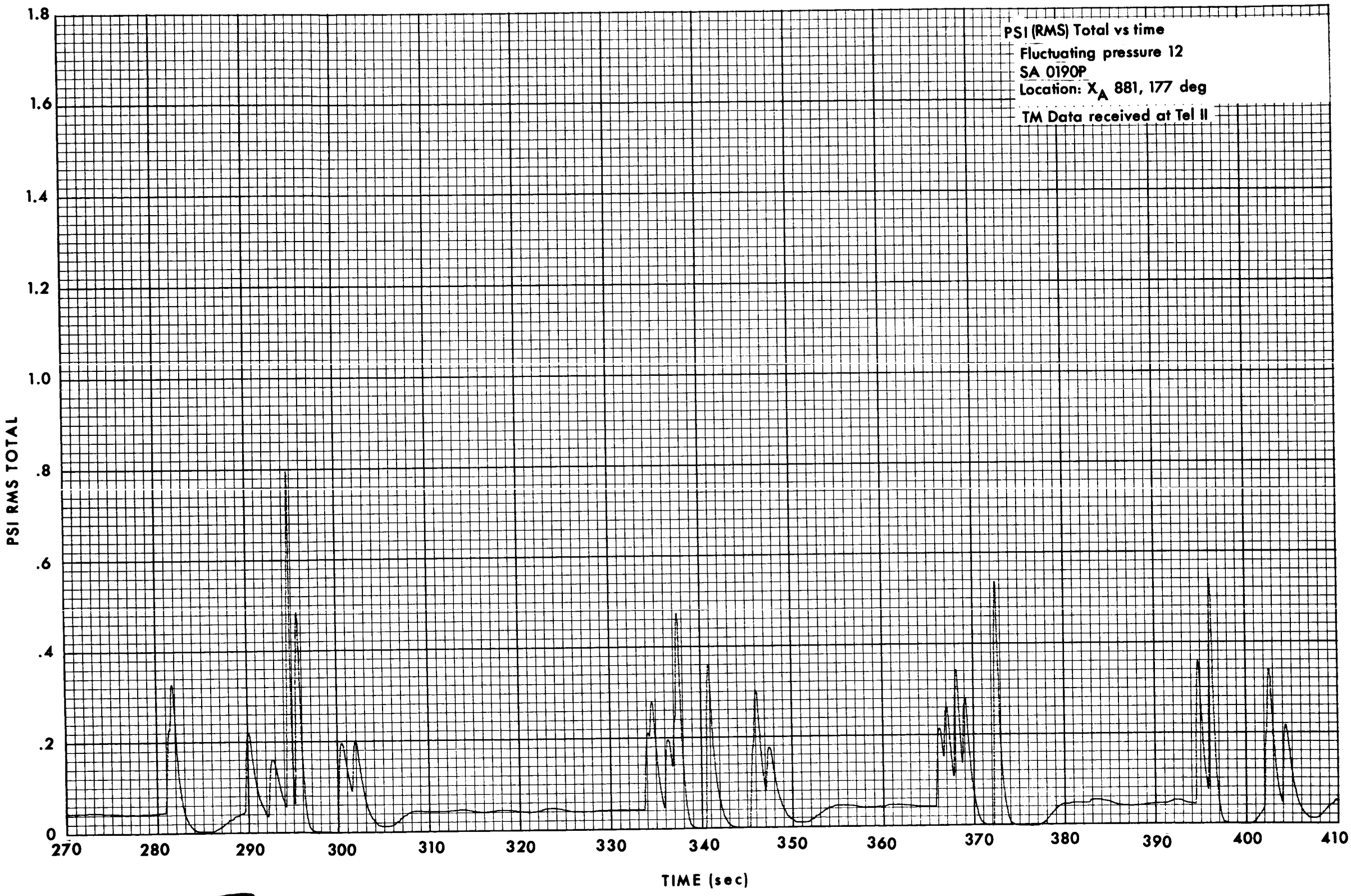
Orbit Insertion

550 560 570 580 590 600 610 620 630 640 650 660 670 680 690

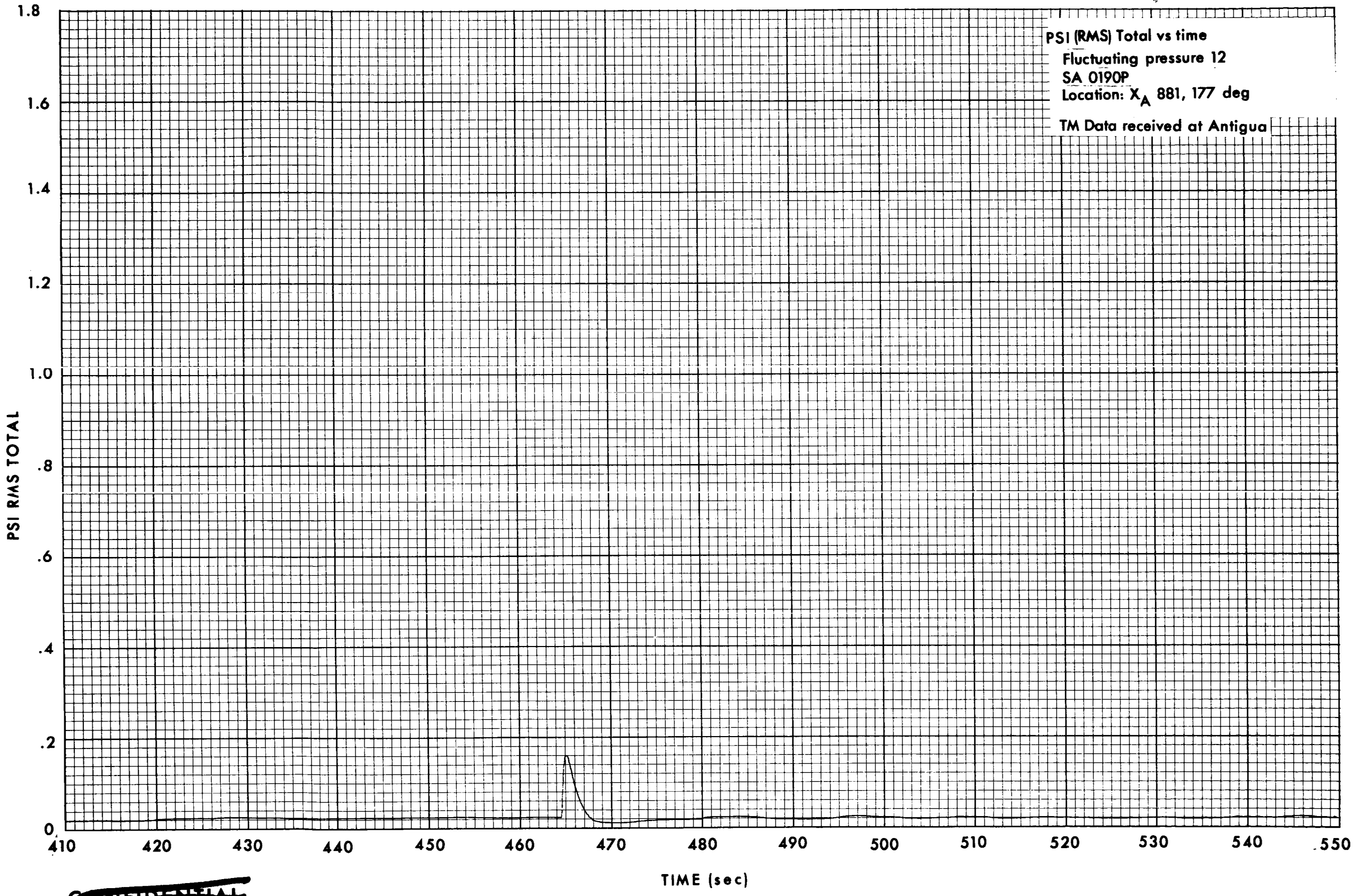
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 12
SA 0190P
Location: X_A 881, 177 deg
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 12
SA 0190P
Location: X_A 881, 177 deg
S-IV Ignition
S-I Inbd.
Eng. Cut-off
S-I
Cut-off
Tower Jettison
Data invalid
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

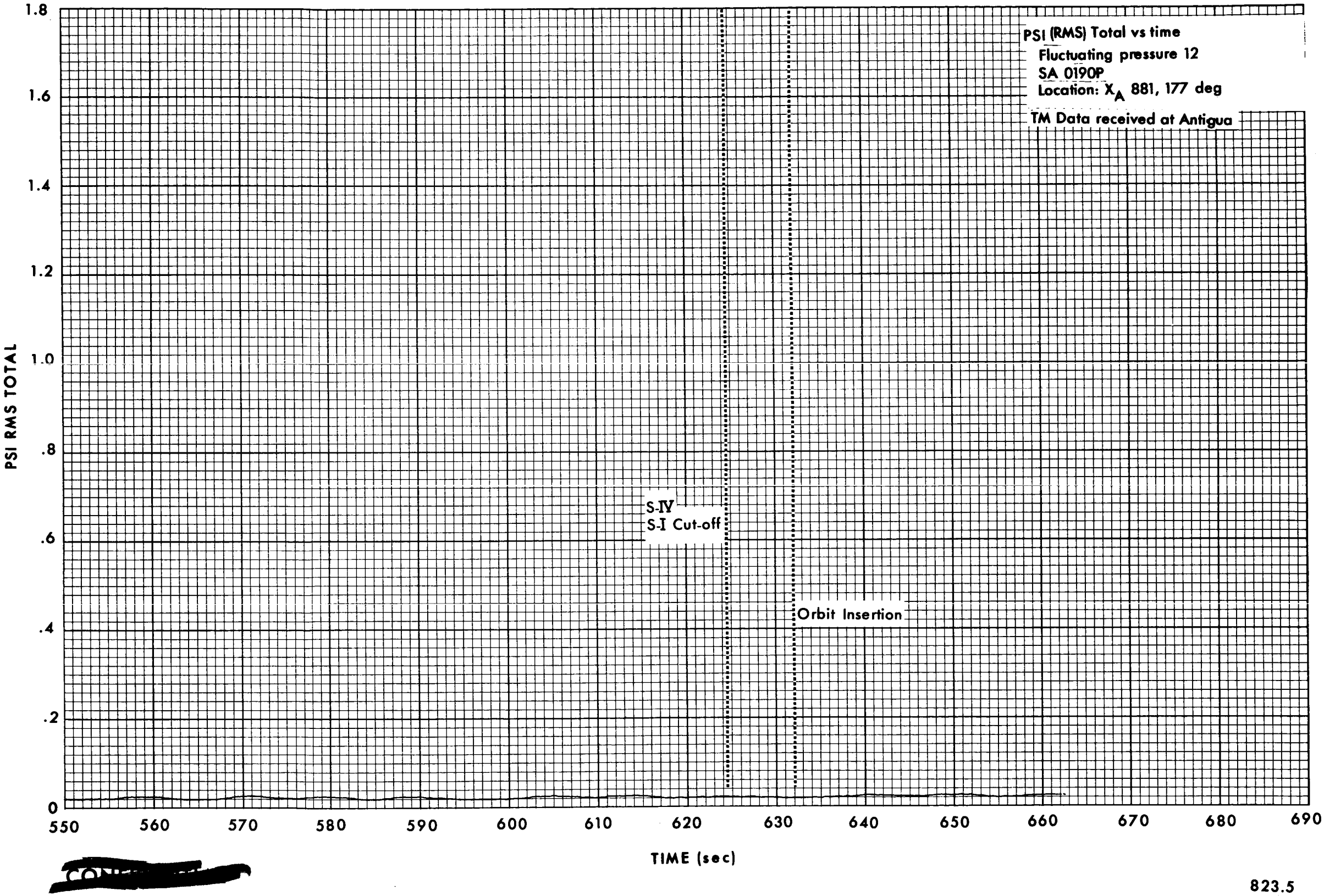

PSI (RMS) Total vs time
Fluctuating pressure 12
SA 0190P
Location: X_A 881, 177 deg
TM Data received at Tel II
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
TIME (sec)

[redacted]

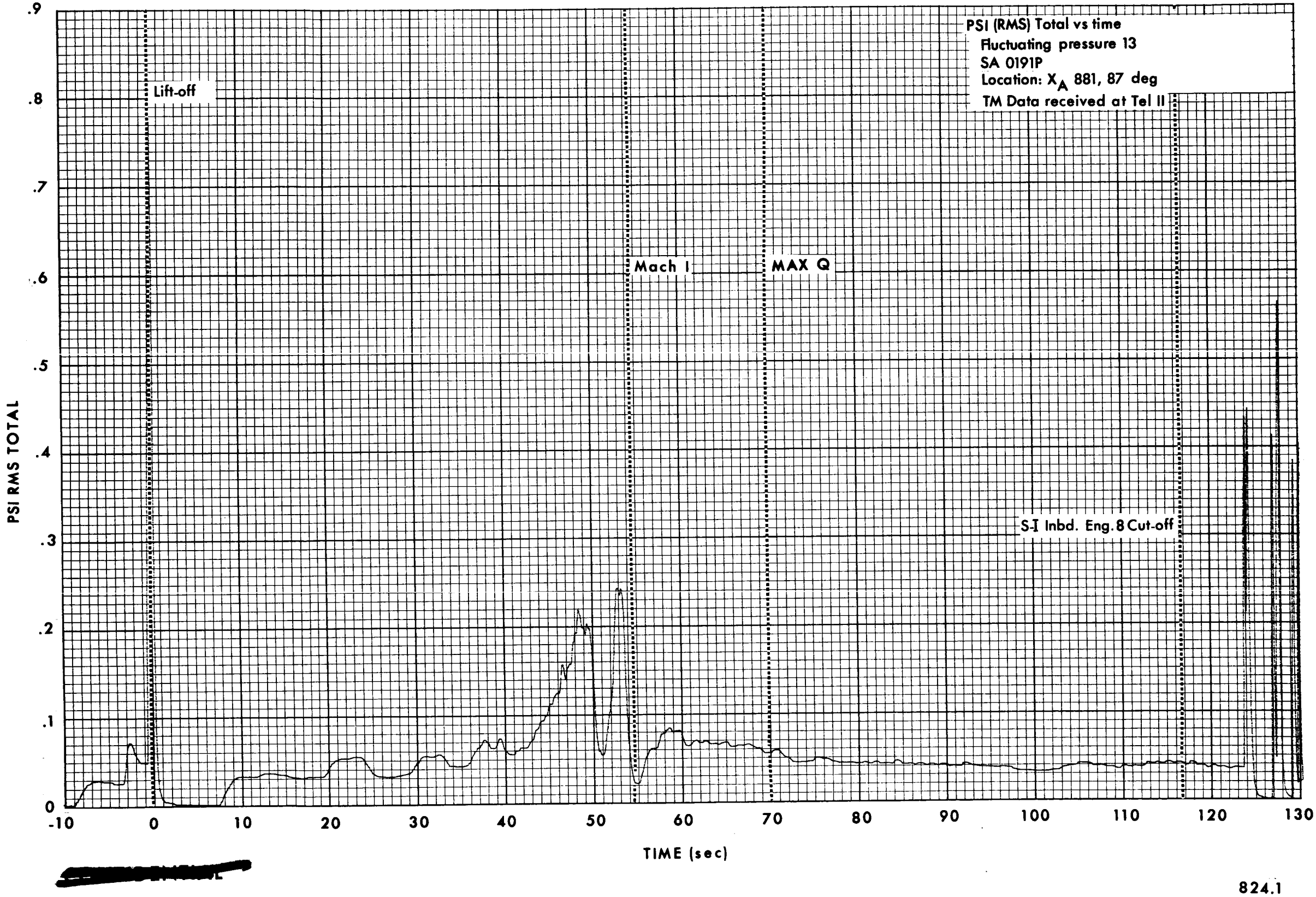


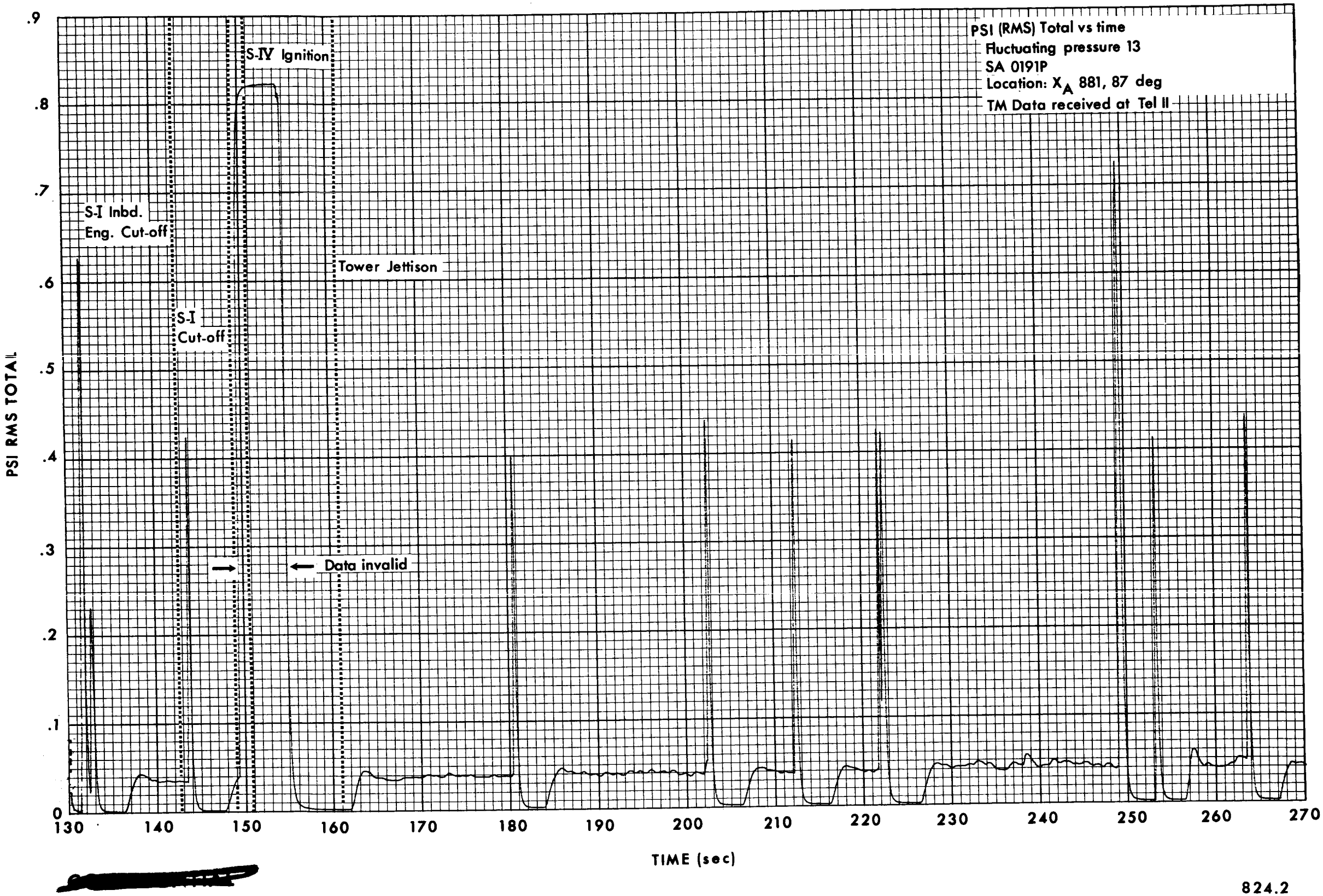
[redacted]

[redacted]



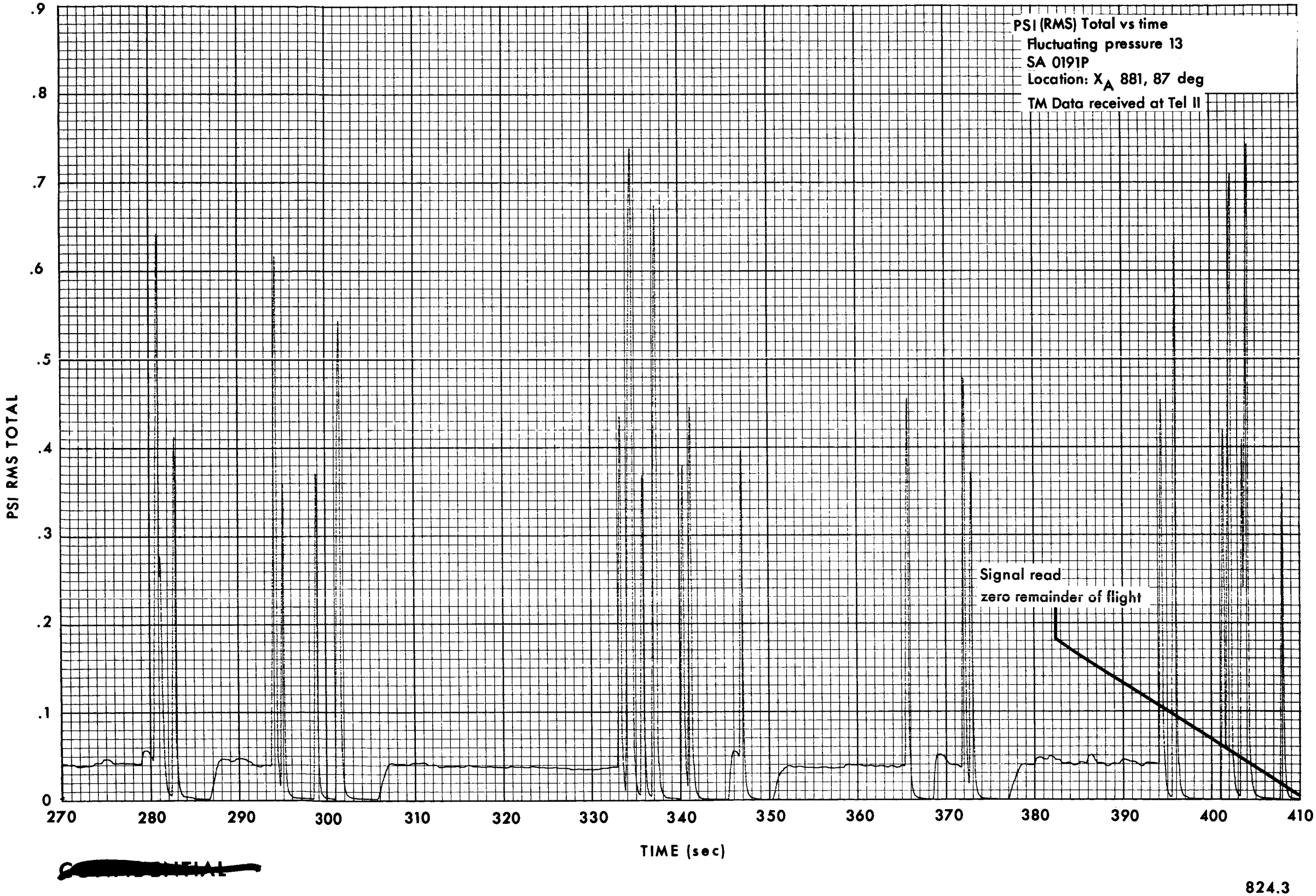
[redacted]


PSI (RMS) Total vs time
Fluctuating pressure 13
SA 0191P
Location: X_A 881, 87 deg
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
PSI RMS TOTAL
TIME (sec)
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130


PSI (RMS) Total vs time
Fluctuating pressure 13
SA 0191P
Location: X_A 881, 87 deg
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
S-I
Cut-off
Tower Jettison
Data invalid
PSI RMS TOTAL
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

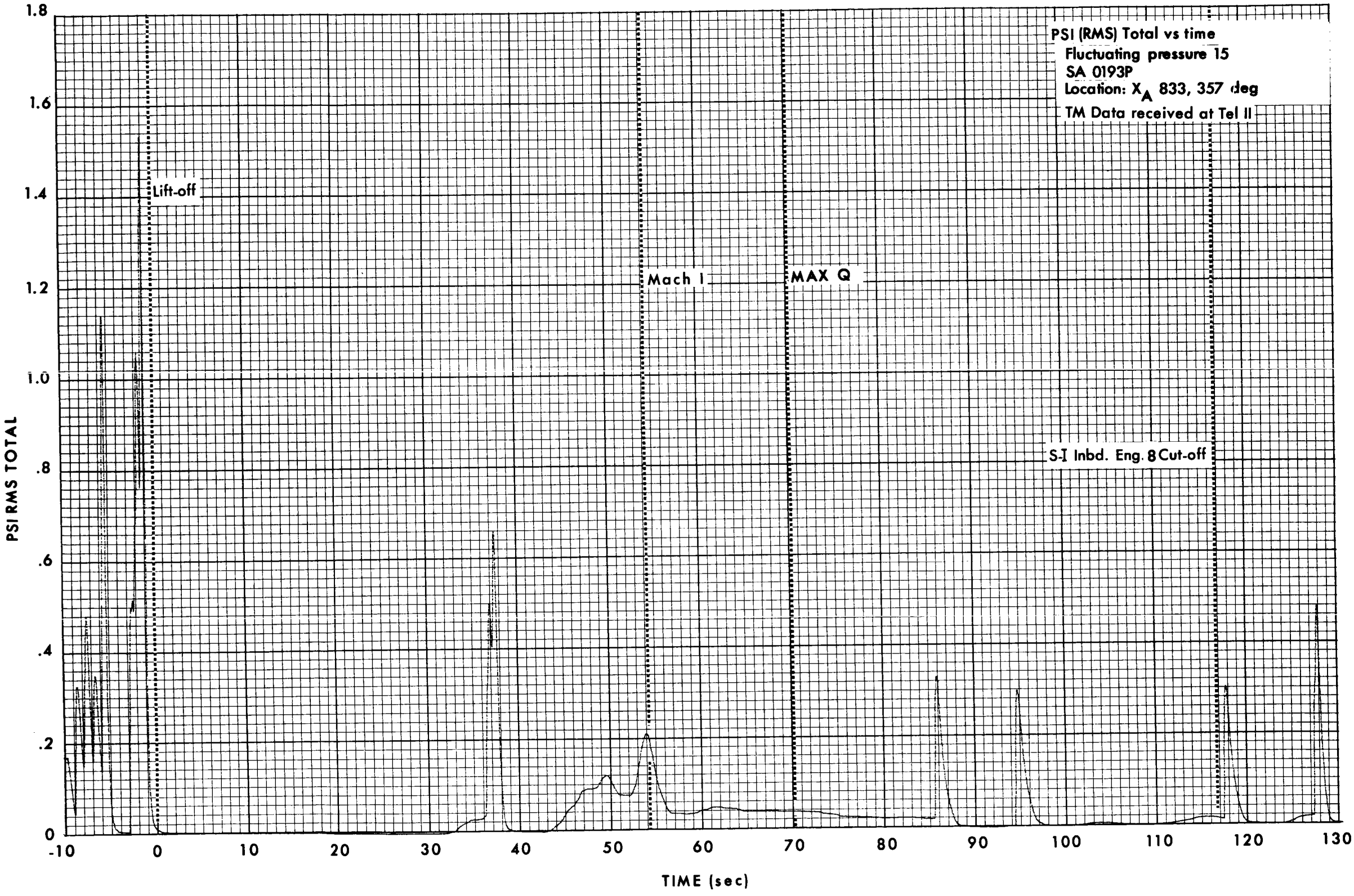
824.2

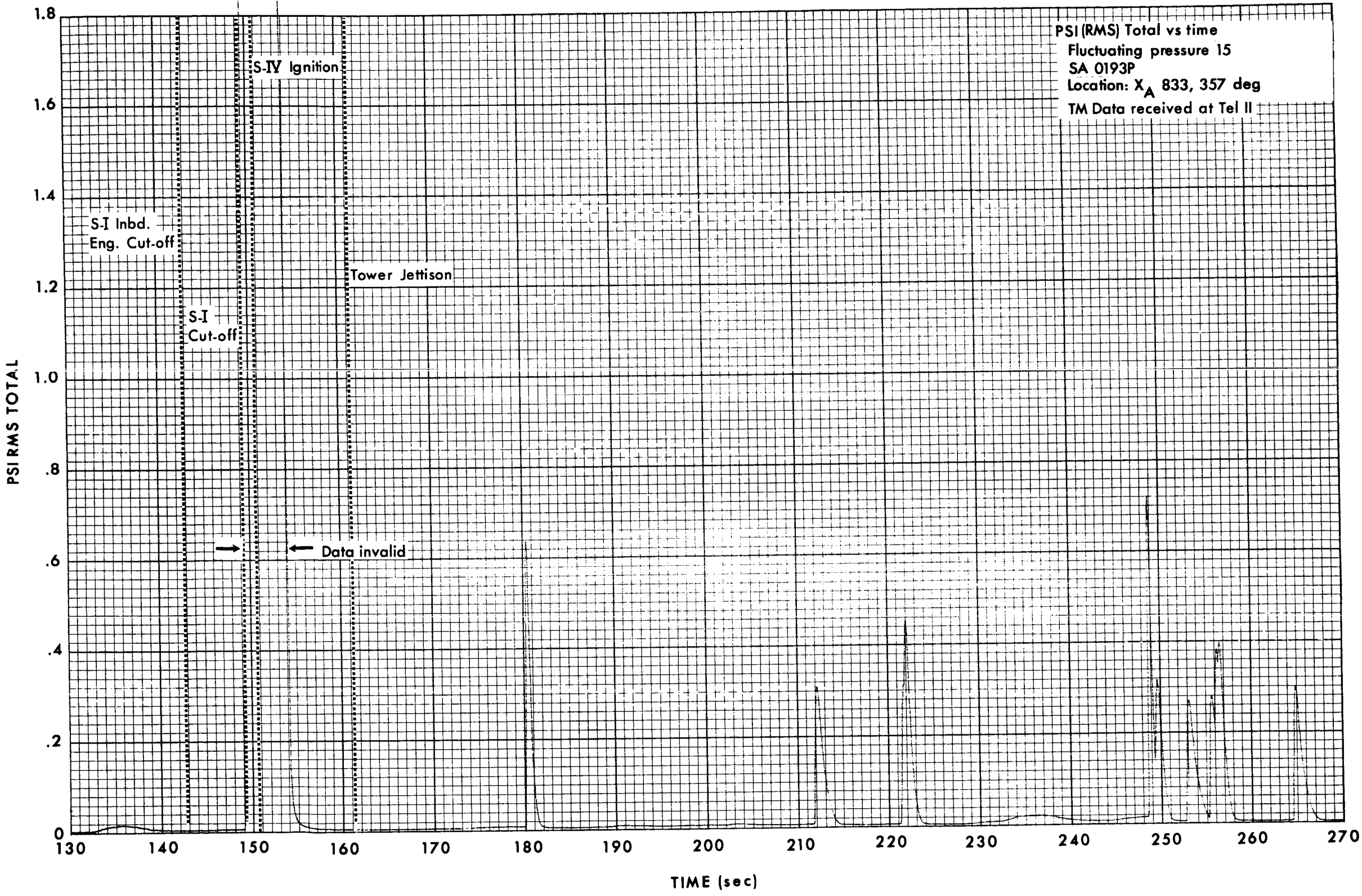
[redacted]



[redacted]

824.3


PSI (RMS) Total vs time
Fluctuating pressure 15
SA 0193P
Location: X_A 833, 357 deg
TM Data received at Tel II
Lift-off
Mach 1
MAX Q
S-I Inbd. Eng. 8 Cut-off
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
TIME (sec)


PSI (RMS) Total vs time
Fluctuating pressure 15
SA 0193P
Location: X_A 833, 357 deg
TM Data received at Tel II
S-IV Ignition
S-I Inbd.
Eng. Cut-off
S-I
Cut-off
Tower Jettison
Data invalid
PSI RMS TOTAL
1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
TIME (sec)

[redacted]

PSI (RMS) Total vs time
Fluctuating pressure 15
SA 0193P
Location: X_A 833, 357 deg
TM Data received at Tel II

Signal read zero remainder of flight

PSI RMS TOTAL

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
.2
0

270 280 290 300 310 320 330 340 350 360 370 380 390 400 410

TIME (sec)

[redacted]

825.3